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A
T R E A T I S E
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M E D I C A L S Y M P A T H Y,
A N D O N T H E
B A L A N C E A N D C O N N E C T I O N
T H
E X T R E M E V E S S E L S
O F T H E H U M A N B O D Y :

C O M P R E H E N D I N G,

- I. The Nature of Sympathy in general; that of Antipathy ; and the Force of Imagination ; and their extensive Importance and Relation to the Animal Economy : With some of Mr. JOHN HUNTER's interesting Observations on partial and universal Sympathy.
- II. The Nature of Febrile Sympathy, and CONSENT OF EXTREME VESSELS, illustrated by practical Remarks ; and a new Explanation of the various Affections of the Stomach and Skin, in Fevers : In which is attempted a full Refutation of the Doctrine delivered by Dr. CULLEN on the same Subject, from the Practical Chair at the celebrated University of Edinburgh.

By SEGUIN HENRY JACKSON, M. D.

Member of the Royal College of Physicians, London, and of the Royal Medical Society, Edinburgh ; and Physician to the Westminster General Dispensary, and to the Infirmary for the Poor of Saint George's, Hanover-Square.

S E C O N D E D I T I O N .

L O N D O N :

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M D C C L X X V I I .



THIS TREATISE

IS RESPECTFULLY INSCRIBED

TO HIS BRETHREN,

THE MEMBERS OF THE ROYAL MEDICAL
SOCIETY OF EDINBURGH,

AS A GRATEFULL TESTIMONY OF THE MANY ADVANTAGES
WHICH HE DERIVED FROM THE INSTITUTION,
WHEN RESIDENT AMONG THEM.

BY THEIR

DEVOTED

FRIEND,

AND OBLIGED

HUMBLE

SERVANT,

THE AUTHOR.

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To the R E A D E R.

Hanover-Street, Hanover-Square,

April 12th, 1787.

AFTER having neglected the Publication of the following Treatise near Six Years, the Author is again induced to offer it, in its original State, to the Attention of the Medical Profession, and in particular the Student ; from a firmer Conviction of the Importance of the Subject, than when it first appeared. The Reasoning he has sometimes successfully indulged, in difficult Cases, from his Partiality to the general Doctrine, has made him confident, that where the Art of Medicine can admit of much Improvement, it will be on the Principles laid down in the following

INTRODUCTION.

lowing Sheets, namely, that a VIS INSITA SYMPATHIÆ rules and directs, and at Times disturbs the whole Functions of the human Body. Her Influence is indelibly stamped on our Nature, by *Actions complicated—Affections wonderful—Impressions innumerable*, daily improving, strengthening, varying, and encreasing, both in Sickneſs and in Health. Let us then, my Brethren, as Slaves to Health, and Enemies to Diſeaſe, unite in the general Cauſe, and by improving, *on this new Principle*, the Practice of Phyſic, raiſe the Names of its moſt ſucceſſful Votaries to the higheſt Pinnacle of Fame.

The Author has read with Pleaſure what Mr. J. Hunter has ſaid on the Subject in a late Publication, and hopes he ſhall ſucceed in his Attempt on ſome future Occaſion, to answer the Objections made by a ſurgical Commentator.

P R E F A C E.

THE author of the following sheets is too diffident of his own abilities, as well as too sensible of the weighty objections there are to the publications of young men, upon professional subjects; not to feel a considerable degree of anxiety for the light, in which his attempt will be looked upon: all that he has to say is, that he does think the subject he writes upon of importance to medicine, and that he has thought upon it long, and attentively; for the rest he throws himself with confidence upon
the

the indulgence of a profession, liberal in the most extensive sense of the word, and the characteristic of which it has ever been, to look upon every effort of its younger members with complacency, and appreciate them with candour.

Indeed, there is a possibility of one event happening, which could entitle him to praise, and this would be, if ~~the~~ honorable ambition of distinguishing himself in the profession he has chosen (however premature the attempt it has given birth to) should at length provoke Dr. Cullen to the combat, which he has hitherto declined; *declined*, it is to be feared, really out of
com-

compassion to his antagonist, but not without circumstances, which have contributed to raise his presumption.

The author cannot finish without acknowledging his, and his readers' obligations to Mr. John Hunter, for the very liberal manner in which he gave him leave to make use of his observations upon the subject of MEDICAL SYMPATHY.

April 9th, 1781.

C O N T E N T S.

P A R T T H E F I R S T .

*O*N the nature of Sympathy in general; that of Antipathy, and the force of Imagination; and their extensive importance and relation to the animal œconomy: with many interesting observations on medical Sympathy.

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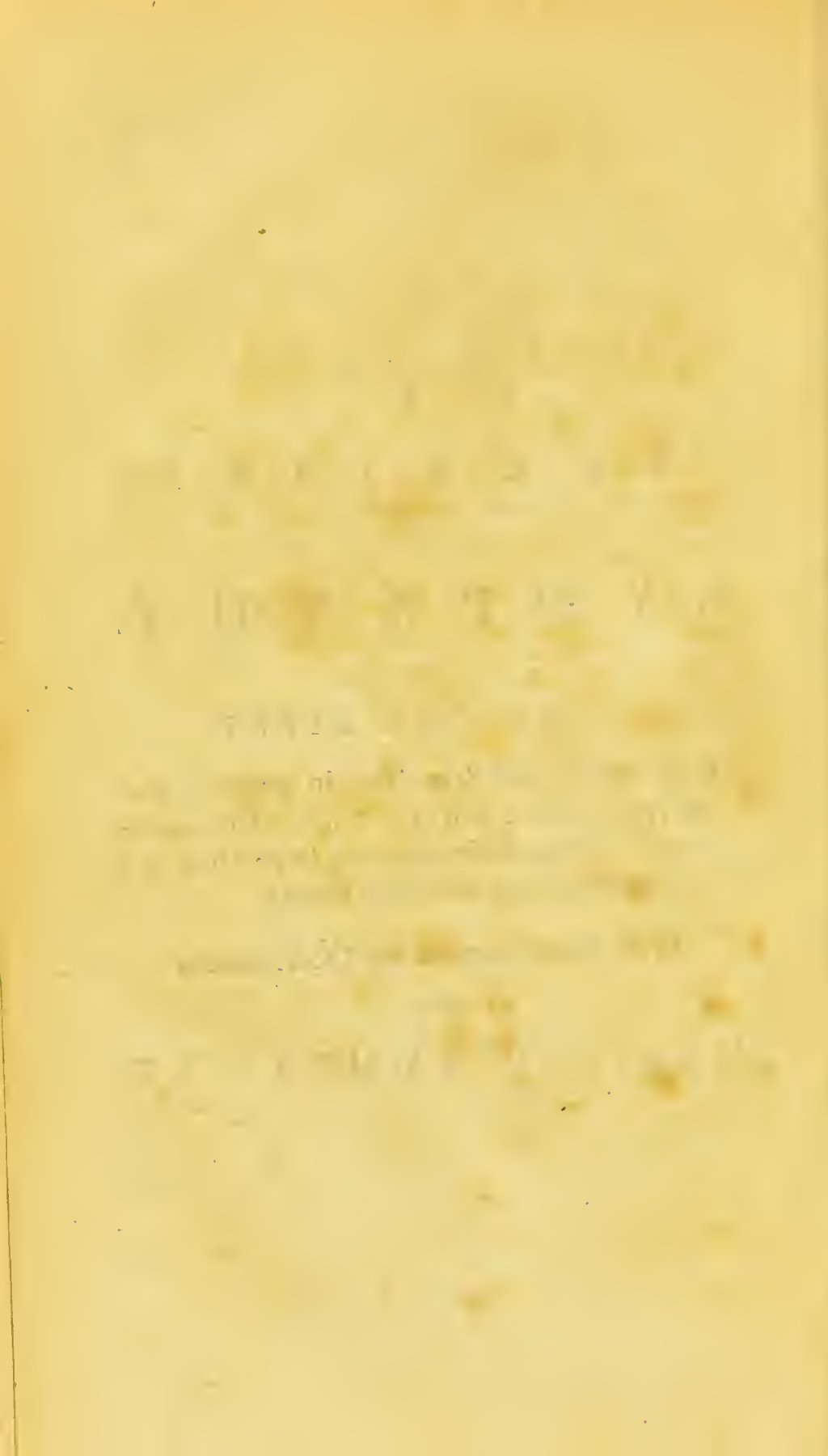
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T R E A T I S E
O N
S Y M P A T H Y.

PART THE FIRST.

On the Nature of SYMPATHY in general; that
of ANTIPATHY; and the force of IMAGINA-
TION; and on their extensive Importance and
Relation to the ANIMAL ŒCONOMY.

With many interesting Observations

O N
M E D I C A L S Y M P A T H Y.



ON THE
NATURE OF SYMPATHY
IN GENERAL, &c.

C H A P. I.

*On the extensive relation of sympathy to the
animal œconomy.*

S E C T. I.

*Sympathy, the first and last principle of animal
life.*

I.

GENERAL doctrines are premised
in MEDICINE, that we may *rationaly*
establish a systematical mode of pre-
serving health, and of preventing and curing
diseases, and they are called its Institutions.

II.

Hitherto authors and teachers of medicine
have delivered the institutions under three

4 ON SYMPATHY IN GENERAL.

general heads or divisions ; to wit, the following.

1st. The doctrine of life and health, or phyfiology.

2d. The doctrine of difeafes, or pathology.

3d. The doctrine of the materia medica, or means ufed in the practice of phyfic *.

I fhall take the liberty of adding a fourth, very lately difcovered, but of fufficient importance to claim a place and engage our attention ; namely,

4th. The doctrine of reftoring animation, or the vital principle, when apparently loft. Or, * * * * *.

III.

Sympathy is concerned in each of thefe doctrines (II. 1, 2, 3, 4.). Life and health exift by it ; the theory of pain and difeafe is often built upon it ; relief is frequently

* Therapeica.

obtained from medicines, by their sympathetic operation; and though I am unacquainted with the particular doctrine at present inculcated by the ingenious Dr. Hawes (one of the institutors of the Humane Society) on the recovery of persons apparently dead, I have not a doubt in my own mind, but that sympathy is the surviving principle in the animal œconomy, through which the means of restoring life succeed, applications being generally made to the stomach, which is the seat and fountain of sympathy.

IV.

Sympathy even gave us life; she breathed into us when born into the world; she preserves our lives while in it, guards us against the diseases of it, proves fatal to us when in excess, and when life has not been too long *apparently* extinct, is capable of restoring us the world again.

V.

Sympathy does not belong more particularly to the nervous system, than to other solids in the body. If it be attached in par-

ticular to the moving extremities of the nerves, commonly called muscular fibres, independent of the nerves themselves, (Dr. Cullen has delivered it as his opinion that they are appendages to the nervous system) we must then consider it as a principle of simple life, or in itself the *living principle*. On the contrary, if we admit Dr. Cullen's idea of their nervous connection to be well founded, and the nerves to be mutually concerned, we must then lay it down as a principle belonging to the nervous system ; or of itself the *sensitive principle*.

VI.

Sympathy, whether owing to a connection with the brain or not, is certainly a quality of the living solid, and moving fibre.

C H A P. I. S E C T. II.

Sympathy, when mental, and when corporeal.

VII.

Sympathy is of two kinds, mental or corporeal. The first arises from a sensation in the mind, determining to particular organs, or particular parts of the body, and raising in them

them certain feelings, actions, and inclinations, sometimes agreeable, and sometimes disagreeable. Of this sort are longings of various kinds, depressing passions, &c. These I would call SYMPATHIES OF CONSCIOUSNESS.

VIII.

The second kind depends upon the operation of external bodies, and the condition of the moving and sentient extremities of the nerves; and more generally occurs in diseased states of the system. These I would name SYMPATHIES OF IMPRESSION.

IX.

Both kinds of sympathies (VII. VIII.) are produced through the medium of the five principal senses; but in a more particular manner the sympathies of impression (VIII).

X.

A certain force of impression is often necessary to produce some of the sympathies of impression, (VIII.) Thus in some diseased states of the system pain becomes the necessary agent.

XI.

An itching is to be considered as a lesser degree of pain, but it will not raise that sympathy, which stronger pain in the same part would do. However, an itching will sometimes of itself produce sympathetic actions.

XII.

The operations of sympathy are often proportioned to the strength or weakness of the parts sympathizing; and are themselves stronger or weaker according to the influence of custom and habit.

XIII.

Different sympathies do not always point out a different mode of action in the causes producing them, but a variety only in different constitutions. The same cause will produce in some sickness at stomach, in others a pain of the ear, or the tooth-ach.

XIV.

Any particular sympathy is increased by the mind's dwelling long upon it. Thus,
for

for instance, LOVE is a sympathy of consciousness, (VII.) to which duration and attention are necessary to give it its full effect. The mind is induced to yield to these from the pleasure it enjoys from them, though this is often mixed with excruciating anxiety.

XV.

When the force of an impression has continued any length of time, with a correspondent attention of the mind to the impression, the sympathy arising from it will even continue long after the cause of impression, originally producing it, has ceased to act. Thus the recollection of a disagreeable object, or melancholy event, will renew the impression originally felt from them. The remembrance of absent love has also a similar effect.

XVI.

From length of time, the cause having ceased to act, the impression grows weaker and weaker, until the sympathy at last ceases altogether.

XVII.

The same or similar cause of sympathy again operating, does not so readily produce

the same impressi^on as before. Hence, all new sympathies are, *cæteris paribus*, the strongest.

XVIII.

Sympathies often shew themselves, not at the part where the impressi^on was first made; but at a distant part, where those nerves terminate that were originally impress^{ed}: Thus, an uneasy sensation has been felt at the fingers; though the cause producing it in fact existed in the substance of the brain:

XIX.

The sympathies attending the healthful state of the system are in general agreeable and pleasant. Those attendant on diseases are in general disagreeable and often painful: such, for instance, as proceed from debility, lassitude, difficult respiration, &c.

XX.

No sympathies arise originally in the mind, without being preceded by, or mutually accompanied with, some change in the actions and affections of some part of the
body.

body. Thus longings are produced probably by some change of action in the organs concerned.

CHAP. I. SECT. III.

Sympathy when inherent, and when acquired.

XXI.

Sympathies are either *inherent* or *acquired*. The inherent ones are those which particularly fall under the direction of the *vis conservatrix* and *vis medicatrix naturæ*, and have commonly an evident utility. Of this kind are the sympathies between the stomach, and the whole system, and between the stomach, uterus, and skin. Hunger and thirst are sympathies of this kind.

XXII.

Those may be called *acquired*, which are only brought to light by the occurrence of disease, and do not appear to answer any very apparent end or utility. I may mention, as of this kind, the sympathetic pain between the inflamed liver and shoulder;
the

the uneasiness at the glans penis, from disorders of the urinary passages, &c.

XXIII.

The inherent sympathies (XXI.) attached to the living solid and moving fibre, remain some time after life is apparently lost, (III.) and constitute a *vis vitæ restauratrix*.

XXIV.

The acquired sympathies (XXII.) have a given duration, they cease on the abatement of the morbid affection, and return not again but with a renewal of the cause.

XXV.

Sympathy, as an inherent quality of the moving fibre and living solid, commonly takes place from changes in the affections of the brain and nervous system, which excite or alter the actions of the moving fibres.

XXVI.

Sympathies are called forth, when the balance between the contraction and relaxation of moving fibres in any part is lost,
in

in which case they constitute what is called spasm and convulsion.

XXVII.

The sympathies of spasm and convulsion more generally occur, when the loss of balance (XXVI.) is in any part of the circulating system. By such violent exertions of the muscular system the balance may probably be again restored.

XXVIII.

The great variety of spasmodic and convulsive affections may depend upon the difference of the part where the balance in the circulation is disturbed.

XXIX.

Sympathy (XXI.) is often an imitative faculty, sometimes involuntary, often without consciousness: thus we yawn when we see others yawn. "So the laughing of
"another maketh to laugh."

XXX.

Sympathy directs us to the objects on which the gratification of our appetites and
inclina-

inclinations is founded (XXI). It raises also within us propensities of the inherent kind, which have for their object the removal of some uneasy and painful sensation. Of this kind are yawning, stretching, sneezing, sighing, coughing, hiccuping, vomiting, and the like.

CHAP. I. SECT. IV.

How sympathy prevents and cures diseases,

XXXI.

Sympathy is nature's hand-maid in the constitution and government of the animal œconomy.

The *Vires conservatrices* and *medicatrices naturæ*, and I may now add the *vires vitæ restauratrices*, are every where, and at all times, directed by the influence of sympathy in the constitution.

XXXII.

Sympathy not only assists in the operations of those causes, which are by their nature calculated to stir up healthful actions
in

in the system, but it also guards us against the dangerous consequences, which might arise from other causes, which from their nature, tend to diminish the due energy and activity of those functions by which alone life is supported. Hence many narcotic powers become immediately causes of stirring up very considerable sympathetic operations in the animal system. Such are cold, sedative passions, poisons, &c.

XXXIII.

These sympathetic operations so called forth, are always of the inherent kind (XXI). When narcotic powers very violently operate, they produce such a dangerous degree of collapse, that the loss of life is apparently threatened. It is then that the speedy application of stimulating powers becomes necessary, in order to fan into life the expiring flame of sympathy (III).

XXXIV.

Sympathy, and, in a more especial manner, the inherent, mostly relates to those parts of the system, where connections are
 established

established between the brain, and certain parts of the body, which have a common function and constitution. These parts, and the brain, are mutually affected either from some original difference and alteration in the condition of the brain itself, or from the same first taking place in those parts, which from relation to the brain, and their own similarity of organization, are more particularly disposed to consent. The organs of voluntary motion; the *primæ viæ*, and more especially the stomach; the *heart* and circulating system, and in particular the cutaneous extreme vessels, with those of the first passages; the uterine system, consisting of its numerous external and internal appendages, are in a peculiar manner under the influence of this mutual and reflex sympathy, and are to be considered as of the first importance in pathology.

XXXV.

What I have said in XXVI, XXVII, and XXVIII, is agreeable to this mutual sympathetic dependance between parts, that have
been

been endowed with a common function and constitution; namely, that a sympathy (XXI.) probably exists between the organs of voluntary motion, and the circulatory system; for Dr. Cullen has observed in his Institutions of Medicine CLXIV, that “The motion of the blood in the arteries of any particular part is promoted by the action of adjoining muscles.”

XXXVI.

These various leading sympathies in the animal œconomy (XXXIV.) cannot be explained upon any known, or even imaginary, continuity or contiguity in the origin or course of the nerves belonging to the parts so sympathizing; and in my opinion, can only be explained by supposing, that, from a law implanted in the animal œconomy by the *Supreme Being*, these parts being of the first importance to the principal functions of life, are more immediately under the influence of the *vis conservatrix* and *vis medicatrix naturæ*, which in all probability act by a general impression, first made on the brain, and then determined to the particular part, where the necessary sympathy is required.

C H A P. II.

Sympathy, which attends the healthful state of the system.

S E C T. I.

Sympathy, one of the most extensive principles in the animal œconomy.

XXXVII.

SYMPATHY is a *principle* in animal bodies so connected with them ab origine, and so attached to them even when animation has apparently ceased, that, in the first place, hardly any *actions, affections, or impressions*, can be produced in any one part during life, without also producing secondary *actions, affections, and impressions*, in other parts.

XXXVIII.

Secondly, for some time after life is apparently destroyed, it is impossible to fix any precise time, when we can say it is absolutely irrecoverable, and for ever lost to its former,

former, though stationary, existence. (III. XXIII.)

XXXIX.

Sympathy is one of the most extensive principles in the animal œconomy, and may justly be considered as the basis of all its compound actions. (IV.) It is very easy to shew that the most perfect animals are endowed with *sensation* and the *simple principle of life*. Out of these two arises the *mind*, as a third principle. These three principles then, *simple life*, *sensation*, and the *mind*, which is a compound of the other two, have each their peculiar affections, which affections produce similar sympathies.

XL.

I have already (as in the preceding Chapter) divided sympathy into *mental* and *corporeal*, the latter of which includes the two principles of simple life and sensation. They in general so strongly co-operate together, that it seems to be difficult, and even unnatural, to distinguish their separate affections.

XLI.

Sympathies arise from the readiness of any part of the body to fall into action, without any positive cause operating upon it, but solely in consequence of some action, affection, or impression, having taken place in another part of the body. (VII. VIII. XXI. XXII.)

XLII.

Sympathy in some instances is an imitative sensation in the same body, as well as between different bodies. (XXIX.) It is imitative, in the same body, when the sympathiser is affected in the same manner as the part originally affected.

XLIII.

Sympathy is not an original, but a secondary affection; it acts often as a cause of other affections; and these again may become causes of other sympathies; each of which may again produce other actions, affections, and impressions. So that we have thus a long succession of sympathies.

XLIV.

Sympathy is greater in young than in old people; it is much less determinate in the
young,

young, than in the old, which most probably arises from the parts of a young animal being more susceptible of irritations,

XLV.

The sensitive principle is not so determinate in young animals as in old: thus (says Mr. J. Hunter) if I prick my finger, the particular part of sensation belonging to that part is so beaten already, that no other part will sympathize: but in a child, where the sensation is not so determinate, every part will sympathize, and the whole body be thrown into convulsions,

XLVI.

I think that the convulsions which attend the teething of infants, are also owing to the same condition of the sensitive principle (XLV.), which is not equally affected under the same circumstances, i. e. during the same process, later in life,

XLVII.

Sympathy thus depends upon the different degree of sensibility in the individual body, and, together with its affections, becomes more or less confined. (XLIV.)

CHAP. II. SECT. II.

Sympathy, when similar, and when dissimilar.

XLVIII.

Sympathy is either similar to its original cause, or dissimilar: and its affections or actions may again be similar to those, which have already taken place in other parts, or dissimilar according to the affections of the sympathant.

XLIX.

Sympathy is similar, when a part sympathizes, i. e. has any affection or action, and another part, not apparently connected, has an affection or action similar to the other. We then say, in the language of Mr. J. Hunter, that the sympathiser has the same cause as the sympathant, which had produced the original affection or action.

L.

Sympathy is dissimilar, when the affection or action in the sympathiser is dissimilar to the affection or action in the sympathant,

pathant. We are then to conclude that the causes producing the affections are different.

LI.

Upon the same principle of dissimilarity, (L.) affection in the sympathant will often produce action in the sympathiser: and sometimes on the other hand, action in the sympathant will produce affection in the sympathiser.

LII.

To explain this: If you strain your ankle, or suffer much from the dressing of a wound, either will produce sickness and vomiting. The affection of the ankle from the strain, or wound, is either a sensation, or an affection producing a sensation, to wit, pain, yet this sensation from affection produces action in the stomach, where no morbid condition or affection can be supposed to be then present,

LIII.

Sometimes the action or affection of the sympathiser will be different from that of the sympathant. Thus syncope has occasionally followed the voiding of costive

faces. Their labored expulsion is attended with a sensation producing action from *excitement*, yet this sensation causes an affection of the sensorium from *collapse*. Here the head sympathizes with the rectum, tho' the two affections are dissimilar.

LIV.

This difference of affection and of action will not in every case arise in the sympathiser, from a difference in the nature of the part sympathising, but often from the nature of the stimulant.

LV.

A stimulant of one kind shall produce an affection or action of the same kind in the sympathiser; while a stimulant of another kind shall produce a sympathy of a different kind.

LVI.

It is even possible that a stimulus of the same kind shall produce a sympathy in one part of the body, and yet not in another, though

though the mode of action in the stimulant be the same in both parts.

CHAP. II. SECT. III.

How sympathy is varied in different animals.

LVII.

Sympathy is similar, in the same animal when the actions, affections, and sensations are exactly the same. It is dissimilar, when the actions, affections, and sensations, of the part sympathising, are different from the actions, affections, and sensations of the part impressed.

LVIII.

Such sympathies as arise from the affection of any one principle, as that of animal life, the sensitive principle, or the mind, *singly*, or from affections of two, or all of them, *combined*, if similar, are like the unisons of sounds in music, or the unisons of combinations of sounds.

LIX.

The idea of a similar irritation or sympathy is confined either to those animals that are wholly similar, (if there are any such) or to those animals whose parts are endowed with similar actions and affections.

LX.

Animals have not all their original actions similar, or produced alike from the same irritation or stimulus, but from different ones; nor are all animals confined to the same actions or affections in different parts.

LXI.

The same stimulus shall produce actions or affections, which shall be the cause either of a similar or dissimilar action, or of both kinds of actions, according to the variety of affections of the different parts that sympathize; so that a compound sympathy may take place.

CHAP. II. SECT. IV.

Sympathy least varied in the most simple animal.

LXII.

The most simple animal always admits of the most simple, and most similar sympathy; but it is also probable, that such are not only capable of the same sympathy, but also of different sympathies, (XLVIII, LI.)

LXIII.

A polypus may be considered as an instance of a simple animal. It has been supposed to have agreeable and disagreeable sensations or affections; as in the first place, hunger, which is a disagreeable sensation; secondly, the propagation of its species, which is an agreeable one. But these will not take place without their proper causes.

LXIV.

Too great a degree of heat, or too great a degree of cold, stimulate much; both of them must therefore become disagreeable; but what variety of affections they must produce in a simple animal is not yet known.

In

In a compound animal they may produce a variety of sympathies.

LXV.

An animal may have an agreeable feeling, yet no sensation of it; but every part of the body of the most simple animal is capable of being stimulated, and of sympathizing with another part, whatever be the stimulus that gives the impression. This (Mr. J. Hunter has alledged) will take place in the inverse proportion to perfection.

LXVI.

A child in the womb has been considered, as less susceptible of stimuli than a polypus. May it not have agreeable and disagreeable feelings, without a sensation of them? I suspect a child in the womb sympathizes with the mother. Hence the fatal consequence to the child of drunkenness in the mother, of violent frights, &c. (LXII.)

LXVII.

A simple animal has the fewest sympathies, for if you compound an animal, each
part

part has its peculiar part that sympathizes with it, in proportion as you make it more compounded.

CHAP. II. SECT. V.

Sympathy most strongly marked by affections of the stomach.

LXVIII.

Hunger, in the most perfect and compounded animal, is a sensation arising from sympathy; that is, the stomach sympathizes with the whole body in a state of inanition. (XXI.) Here a kind of reflex sympathy is said to be produced. The stomach sympathizes with the whole body during hunger, and is thereby excited to action, which action acts again upon the body, so as to call up other actions in the system different from the former. (XLIII.)

LXIX.

When hunger has ceased, from the acquisition of a sufficient quantity of aliment to the stomach, this sympathy is succeeded by
heaviness

heaviness to sleep, as if the brain, or mind, conscious of the utility of rest to digestion, withdrew for a while its powerful influence over the system, that the function of the stomach might at first proceed undisturbed.

LXX.

The whole system sympathizes with the stomach variously, according to the nature of the stimulus. When the stomach is stimulated in one way, a sweat shall break out on different parts of the skin; when in another way, universal debility shall be produced, together with pain in the head. When the head aches, we have sickness at stomach. These are two different sensations, though the nature of the stimulus which produces each, is probably the same. An external injury often causes sickness, &c.

LXXI.

Some sympathies of impression and of consciousness from external objects require a certain degree of warmth, a certain supply of nutriment, and a certain state of body to produce them. Thus a Man, in perfect

fect health and vigor, who lives well, &c. shall be so captivated by the beauty of one woman, or the good sense and understanding of another, as to excite a *sympathy of impression* from the sight of the one, and *sympathy of consciousness* (XIV.) from the company of the other ; but, on the contrary, if he be lean, starving, &c. no such impression or affection shall be produced ; the mind not being in full possession of all her powers, by which she is rendered susceptible of these stimuli, unless the body is properly nourished.

CHAP. II. SECT. VI.

Mental sympathy often connected with simple life, and how.

LXXII.

Three kinds of sympathies (XXXIX.) are supposed to exist, which may often be compounded ; to wit, those of simple life, of sensation, or the sensitive principle, and of the mind, each of which is not capable of producing irritations, affections, and actions, without some other irritable part through sympathy being affected in a dissimilar manner. (L. LI.)

LXXIII. A

LXXIII.

A few examples may be mentioned. An injection into the urethra will sometimes produce sickness at stomach.—Great affections of the mind will often produce involuntary motions, even in those muscular parts that are not immediately under the influence of the will.—Fear will make the hand shake; or it will produce laxity of the bowels and diarrhœa; or it will affect the bladder with an involuntary flow of urine; or it will affect the eyes, so as to occasion a secretion of tears.

LXXIV.

It is not yet precisely understood, how far the third principle, the mind, is capable of sympathising with the first principle, simple life. But it does appear, on some occasions, as if the state of the mind became affected by the state and condition of the body.

LXXV. Simple

LXXV.

Simple life belongs more particularly to the natural functions of every animal, such as digestion, and the like. An affection therefore of the mind may be produced by an affection of part of the body only, as the stomach, &c. There are instances, in which it appears, that the mind is capable of sympathizing with life, as in the hypochondriac affections.

LXXVI.

On the other hand, the mind will be often light and easy, without any apparent reason or cause, which may rationally be attributed to a sympathy it has with some part of the body in a state of rest, or in a condition of performing its function with uninterrupted ease and freedom.

LXXVII.

In the hypochondriac affection, some part of the body, particularly connected with the natural and animal functions, is in all probability diseased, though we cannot ex-

C

actly

actly say what the disease is. The body thus interrupted in its more common action, produces affection in the mind. (L. LI.)

LXXVIII.

The full force and vigor of the mind arise from the senses being at rest, or at ease; and its variations, as far as they relate to the greater or lesser degree of its excitement or collapse, most likely depend upon one or more of the senses, or functions of the body, being some way deranged, and disaffected.

LXXIX.

The mind sympathizes with the first principle, simple life, through the affections of the second, the sensitive principle, which constitutes what is called instinct: or in other words, the mind may be said to sympathize with the living principle in her wants. Mr. J. Hunter observes, that there is a necessary connection kept up between all three.

C H A P. III.

On the Sympathies which attend diseases.

S E C T. I.

Inflammation, when sympathetic, and when specific.

LXXX.

IN Chap. I. Sect. IV. I mentioned the relation of sympathy to the animal œconomy, in the prevention and cure of disease. There are some sympathies purely preventative; such are some of the phænomena at the commencement of fever, as nausea and loathing of food. These affections of the stomach are produced before the fever is formed, in order to remove by re-action the principal and supporting cause of fever, whether at the stomach or skin. The sickness of pregnant women, from the great sympathy between the stomach and uterus, often, I believe, prevents abortion and premature labor. A vomiting will even prevent premature death. (XXXIV.)

C 2

LXXXI. Some

LXXXI.

Some of the sympathies which attend diseases contribute towards a cure, many are apparently useless. They may vary much either from the nature of the part sympathizing, or from the nature of the stimulus belonging to the specific quality of the disease.

LXXXII.

It is not in all cases easy to be determined, how far sympathy is similar to its cause, either in the specific effects of the stimulus, that has specific properties, or in the nature of the part which sympathizes, when the whole or some one part of the body is affected with specific diseases. (XLVIII.)

LXXXIII.

Mr. J. Hunter suspects that it is similar in all local sympathies, such as spreading cancer, spreading venereal chancre, &c. These are certainly to be considered as specific diseases, and when parts sympathize with them, and the sympathy is nearly local, then the part that sympathizes seems to be
of

of the same nature with the diseased part itself.

LXXXIV.

When a bubo spreads Mr. J. Hunter considers the surrounding parts as venereal, and calls it a local sympathy. But local and connected sympathy in some of its attributes is not similar, either in the action of the stimulant, or nature of the part sympathizing, so that when any remote part sympathizes, that sympathy is not specific, nor of the same nature as the disease itself.

LXXXV.

These differences, it has been imagined, may arise from some real difference in the nature of the stimulant; or, which is most probable, from a real difference in the part sympathizing. (LIV. LV. LVI.)

LXXXVI.

When the urethra is inflamed by a specific disease, for example, the venereal, the testis often sympathizes; but the sympathy is not similar, and, like the original affec-

tion of the sympathant, specific ; it is therefore to be considered as non-venereal.

LXXXVII.

Two opposite views have been taken of the affection of the glands in the groin, in the case of gonorrhœa. 1st. These glands often swell in this disease ; but as it also very often happens, that they are not venereally tainted, they must therefore be supposed to be affected from sympathy, because they are known to sympathize with the urethra.

LXXXVIII.

Secondly. When the glands of the groin swell, and also become painful, in consequence of a venereal gonorrhœa, it may be reasonably suspected, that it is not sympathy that affects them, but an absorption of the venereal virus ; and if it is absorption, we must consider them as venereally tainted.

LXXXIX.

The first view of this affection of the glands (LXXXVII.) is well founded ; for there is not a doubt, but that they often sym-

sympathize with the irritation of the urethra in gonorrhœal cases. When they, on such occasions, sympathize in consequence of the venereal disease in the urethra, such sympathy arises not from a venereal stimulus at the gland, but is to be considered as a common inflammation.

XC.

In the case of the cancerous breast, the glands in the axilla will sometimes swell, and sooner or later again subside. This affection of the glands has been also considered as a sympathy, because we know of no instance of a cancerous affection subsiding anywhere. This has led Mr. J. Hunter to imagine, that specific inflammations are not able to give to the sympathiser the specific variety.

XCI.

The most cautious investigation has not hitherto been able to determine, how far many other similar properties of specific inflammations differ from their sympathies. But it has been supposed by Mr. J. Hunter, that those complaints, which are common to all parts

alike, such as common inflammation and common suppuration, may have the power of sympathy in these common respects. To illustrate this, it may be observed, that the glands of the axilla swell from the inflammation caused by a blister applied to the breast. An inflammation also of one eye will affect the other.

XCII.

An inflammation of the testis, says Mr. J. Hunter, whatever be the cause from which it arises, or whatever be the consequence which it may produce, will always be attended with a heavy sickly pain. But where the nature of the two parts is such, as to cause a difference in their attributes, there the affections of the sympathant and sympathiser will differ. (LXXXI.)

XCIII.

The same difference will also take place, where the parts themselves differ in the nature of their diseases; so that if any part becomes diseased in a manner peculiar to its attributes,

attributes, the sympathiser will be also affected in a manner agreeable to, and consistent with, its proper attributes,

XCIV,

Again; when the sympathiser has no peculiar or specific mode of action, then it will be affected in the common way, altho' the part stimulated, or sympathant, has some specific nature, or a peculiarity in its mode of action. (LXXXVI. LXXXIX.)

CHAP. III. SECT. II.

Diseased Sympathy, how partial, and how universal.

XCV.

Sympathy in various ways becomes partial or universal. It may be partial from a local or partial injury, or it may be partial from an universal disease.

XCVI.

Sympathy is partial from a local disease, when the causes of action in a part become the cause of action in a distant part. Ex-
empli

empli gratiâ, when any thing tickles the nose or the sides, the muscles of respiration act by sneezing and laughing. Again; when any thing, particularly inflammation, irritates the liver, the shoulder sympathizes. This is an instance of a difference taking place between the action and affection of the sympathant and sympathiser; for the pain of the sympathant is obtuse, but that of the sympathiser acute.

XCVII.

Sympathy may be partial from an universal disease; for instance, the stomach sympathizes with the whole body at the beginning of a fever; and the tongue, it is said, sympathizes immediately with the constitution on the least disturbance: or the tongue and mouth are affected with thirst, when the constitution is in want of fluids.

XCVIII.

There seems to be, from the clearest proof, the same sympathetic relation between the tongue and mouth, and the constitution when in want of fluid, as between
the

the stomach, and the constitution when in want of solid aliment.

XCIX.

Sympathy often becomes universal, from a local or partial injury. Thus when a local injury is done to any part, or an operation of consequence performed, they will each be followed by an inflammation, suppuration, &c. These are to be looked on as local evils; but from such partial affection, fever will arise in the system, which is to be considered as universal sympathy, and is commonly called symptomatic fever.

C.

Wounds and injuries of joints often produce great disturbance in the system, which is indicated by that universal sympathy, commonly called hectic fever, which is sometimes accompanied with partial sympathetic affections. On removing by amputation such diseased parts, this disturbance of the system has immediately subsided. But
it

it will be best now to speak of each sympathy separately.

CHAP. III. SECT. III.

Diseased Sympathy, when particularly partial.

CI.

Partial sympathy belongs to the system, as well when in health, as when labouring under disease; and is therefore natural or diseased. The natural sympathy more properly belongs to the second Chapter, but as far as it is partial, I shall introduce it here,

CII.

Partial sympathy, when natural, always tends to produce some salutary effect. There is an instance of this during the period of utero-gestation, when the breasts of women increase in size, in proportion commonly with the distension of the uterus. Again, their swelling at the time of menstruation, with darting pains in them, is another instance of natural sympathy.

CIII. To

CIII.

To this head of natural sympathy may be referred, the contracting action of the abdominal muscles with the actions of the muscles about the anus and rectum, in the expulsion of the fœces. In a like manner are we to consider the increased secretion of the lachrymal gland, on stimulating the eye-lids, or affecting the mind in any particular manner. But of these natural sympathies I need speak no more, as they are not directly to our present purpose.

CIV.

The diseased partial sympathy may be divided into two kinds, viz. that belonging to sensation only, and that arising from real disease, or diseased action or affection. The first kind of sympathy is the most common. (XCVI. XCVII.)

CV.

The greater the local mischief, the greater is the sympathy and consent: for example, If great mischief is done to the liver by inflammation, &c. the shoulder sympathizes, in
its

its pain in proportion. The more violent an inflammation of the testis, the greater will be the pain in the back.

CVI.

The greater the disease in the constitution, the greater will be the local or partial sympathy; and the greater consequence the sympathant is of in the constitution, the greater the affection of the sympathiser.
(LXX)

CVII.

As examples of the above, we see, that the stomach sympathizes with a disease of the brain, testis, &c. A remarkable instance of it likewise occurs in fever when the affection is proportioned to the spasmodic condition of the cutaneous extreme vessels: therefore in the plague the stomach is more affected than in other fevers.

CVIII.

In the second part of this treatise I shall shew, that there is a wonderful sympathy between the stomach and skin, founded, in
a great

a great measure, on a balance and connection between the internal and external extreme vessels. Hence affections of the stomach often produce considerable sympathetic operations in the skin, so as to throw out sometimes a sweat, at other times an eruption, &c.

CIX.

I have often observed an extraordinary sympathy between the stomach and kidneys. It shews itself both in health and disease. A single glass of wine has often produced considerable diuresis in a short space of time; and great affections of the stomach often attend nephritic complaints.

CHAP. III. SECT. IV.

Diseased Sympathy, when in a special manner universal.

CX.

Universal sympathy takes place, when the whole body in a great measure sympathizes with the disease, which was at first confined to some one part of the body. Thus, symptomatic fever attends topical inflammations. (XCIX.)

CXI.

CXI.

When such universal sympathy subsides from a different mode of action taking place, to wit, from some change for the better which the parts immediately concerned have not been able to bring to a complete cure, the constitution sympathizes in another way, to wit, by hectic fever. (C.)

CXII.

Thus, when the inflammation of any wounded or injured part is gone, but it still remains in an ulcerous state, the constitution is teased; and this teasing Mr. J. Hunter has considered as the principal part of what is called hectic fever; which by most physicians has been generally attributed to the absorption of purulent matter.

CXIII.

It is a very curious and useful observation made by Mr. J. Hunter, that a disease, which the constitution can cure, never produces an hectic. Of this kind are sanious wounds and ulcers; but if such an unhealthy part is removed, even the violence of an operation

operation does not obviate the acquisition of speedy relief to the system.

CXIV.

Mr. J. Hunter has seen a wound in the knee keep a man awake several nights, attended with a constant purging, and the man at the same time becoming hectic. By amputating the part, the man slept the whole night, the purging ceased, and a costiveness rather ensued. (C.)

CXV.

A man with a wound in the elbow joint was attacked exactly in a similar way. His pulse was hard and quick. Within ten minutes after the removal of the arm, the pulse became slow and softer. The constitution immediately felt she had got rid of something she could not manage, and was quiet. In such cases symptomatic fever commonly arises, but they lose the hectic symptoms. (C.)

D

CXVI.

CXVI.

This universal sympathy of the system is greatest, when certain parts are injured. Thus, it will more easily take place, when an injury has been done to an involuntary part, than if the same quantity of mischief had been done to a voluntary part, because the first are more universal in their connection with the constitution than the last, and belong to important functions. (CVI.)

CXVII.

When a vital part is deceased, there is a greater sympathy between the deceased part and other vital parts, than between it and other less important parts of the system : and there must be a failure, in such case, in the function of the less important parts, besides the sympathy of the vital parts. (CVII.)

CXVIII.

Universal sympathy is also greater, if the injury is done to a part far remote from the support of life, the heart, than if the part
injured

injured be nearer, provided the injury be the same. The animal machine is then more conscious of inability, more alarmed, and hectic fever is more liable to be produced. (C.)

CXIX.

Ex. gr. If an injury be done to the toes, or foot, the constitution becomes more affected and disturbed, than if a similar injury had been done to the shoulder, even where all other circumstances are the same. Pulmonary injuries and complaints make however, in my opinion, an exception to this rule. (CXVII.)

CXX.

Universal sympathy takes place more readily, or its actions and affections are more strongly marked, when the powers of the animal machine are capable of repairing the injury received; and, vice versa, it takes place more slowly, and is less strongly marked by its consequences, when the powers of life are more languid. (CVIII.)

CXXI.

The state of an individual body is often such, from various occasional causes affecting the predisposition and temperament, that it will more readily fall into sympathy at one time, than at another. Thus people in general, and women more than men, are easily affected, at particular periods, from slight causes. (XII.)

CXXII.

Not only the same constitution differs at times owing to the change of predisposition, but different constitutions vary owing to the difference of temperament. Hence, it is not at all to be wondered at, that some people's feelings are affected much more readily than those of others. (XLVI.)

CXXIII.

As there is no part of an animal body, that is entirely independent of the constitution, so in all material injuries, the whole must sympathize more or less with a part material-
ly

ly injured : but as every individual part has a more intimate connection with some one particular part, than with the whole together ; such parts, as are particularly connected, must sympathize more readily, and in a greater degree.

CXXIV.

It may be observed, in illustration of this sympathizing connection, that the stomach sympathizes more with a diseased testis, than the scrotum, or the whole constitution. So also the stomach sympathizes most with an affection of the extreme vessels ; and yet I greatly suspect, it is in a secondary way ; viz. through the medium of the sympathizing heart : for it is most natural to suppose that the heart from its connection with them would very readily sympathize with an affection of the extreme vessels. Such a sympathy may perhaps be the foundation of fever, assisted by the operations of the stomach in vomiting, an idea it may be pro-

per to investigate at some other time. We have no ready way of knowing that the heart sympathizes with the constitution, but by the state of the pulse. If the heart can at any time become a sympathiser, it most probably is such when hectic fever accompanies, either a part materially injured, or an universal disease, (C. CXIX.)

CXXV.

Moreover, universal sympathy in the constitution, from local or universal disease, has been said to have its order of parts. Thus the head, the stomach, and the back have been said to be the first parts which sympathize with the whole constitution. From what I have said in the preceding paragraph, *I think the heart must be reckoned with them.* The tongue, skin, and kidneys have been said next to sympathize, &c. Thus there seems to be a certain order of local sympathies from an universal cause.

CXXVI.

CXXVI.

This priority of sympathetic operations in the system shews itself most remarkably at the commencement of fever. Thus the head aches; a pain in the back comes on; the stomach is affected with anorexia and nausea; *the pulse becomes slower and weaker*; the skin becomes dry; the tongue is parched with thirst; the kidneys secrete an urine of a particular quality, &c. All these phænomena seem to arise from sympathy between parts endowed with similar properties and functions.

C H A P. III. S E C T. V.

Universal Sympathy, when immediate, and when secondary.

CXXVII.

Universal sympathy is observed to be either immediate or secondary. The constitutional sympathetic affections may arise in

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many

many cafes from the local sympathy, and not from the action and affection of the part first injured. This is observed to be very remarkable, when the sympathizing part happens to be a vital part, whether the first injured part is vital or not. (CXII.)

CXXVIII.

To illustrate this ; if either the stomach or heart sympathizes, such a sympathy produces more morbid effects in the system, than what the original cause of such sympathy was capable of doing ; and thus the constitutional sympathic affections do not all arise from the first local affection, but some are caused, and some are increased, in a secondary way, through the medium of either the sympathizing heart, or the sympathizing stomach. (CXXIV.)

CXXIX.

Many of these sympathizing connections are by nature fixed and regular. Thus we see, that the muscles of respiration constantly

stantly sympathize with the throat, and nose, when they are tickled, or otherwise irritated. The muscles of respiration also sympathize with the lungs. They become secondarily affected with the disease of the lungs, through the medium of the orifice of the trachea, where the sympathy with the diseased part of the lungs first takes place.

CXXX.

The respiratory muscles are also spasmodically affected in sympathy with the stomach, when disorders of it bring on vomiting. Cough also, and laborious respiration accompany any impediment to the free action of the heart, in giving an even circulation. Stated sympathies are also produced from affections of the uterus. Thus cough and fever are often caused by uterine irritation, at the time of abortion, and when the miscarriage comes away, such universal sympathies very shortly go off. The stomach likewise commonly sympathizes with uterine affections.

CXXXI.

CXXXI.

The glans penis also sympathizes with affections of the bladder, as when there is a calculus, or calculi within it, &c. There is hardly an instance of any one having a disease in the bladder, without being troubled with more or less of a painful uneasiness at the glans penis.

CXXXII.

Again, the head sympathizes with disorders of the stomach; and vice versa, affections of the incephalon often produce sickness and vomiting. An affection of the heart, such as a disposition to syncope, will produce both sickness, and head-ach. The same often takes place, upon recovering from a deliquium animi. Of these and other sympathizing connections (CXXIX. CXXX. CXXXI.) some are natural, some diseased, and some, from accidental circumstances, either natural or diseased,

CXXXIII.

CXXXIII.

On the other hand, some parts of the body seem to have no sympathizing connections ; at least the effects of them are not observable. But those diseased sympathies, which are observed regularly and constantly to take place, have been supposed to have the principal of their regularity and constancy founded upon the sympathizing parts having a natural connection with the healthful operations of each other. Such supposition is very rational.

CXXXIV.

This way of accounting for their regularity and constancy more immediately relates to the sympathetic affections of the vital parts. Thus it holds good with all the parts connected with, and concerned in, respiration, as the nose, trachea, &c.; also in most of the affections of the head, stomach, and heart; and of the stomach with the intestinal canal and rectum, &c. They are in sickness to
be

be considered as no more than the actions of healthy sympathies, præternaturally increased from disease.

CXXXV.

The diseased sympathies, between parts that have no connection, are but few ; there are however some examples of them. Such is the sympathizing affection of the right shoulder with the inflammation, &c. of the liver ; the disturbance of the stomach from affection of the kidney from stone, &c. the affections of the testes in the male sex, and breasts in the female sex, from the swelling of the glands of the neck in the Cynanche parotidœa.

CXXXVI.

Diseased sympathies, which are immediate, take place but rarely between distant parts of the body ; for which reason they are very properly termed irregular. The left arm, however, has been known to sympathize
with

with a diseased bladder, and the left hand with an abscess in the substance of the brain.

CXXXVII.

Mr. J. Hunter relates, at his lectures, a remarkable case of the Earl of Clarendon. He was, it seems, subject to violent fits of the stone, unaccompanied with the usual pain at the glans penis or bladder, but the pain was all in the left arm. When he voided urine, and it was commonly in his fits, the pain in his arm would come on : he became then so ill, that he often thought the fits would kill him, and in fact he was destroyed by one of these fits. This was a very uncommon sympathy, and an irregular one.

CXXXVIII.

It is somewhat remarkable, that few of the sympathies from natural connection can be reversed. Thus when a disease attacks the intercostal muscles, we observe no sympathetic

thetic affection of the lungs and throat; but when a disease attacks the throat or lungs, the intercostal muscles more or less constantly sympathize.

CXXXIX.

When the glans penis is diseased from chancre, &c. no irritation passes to the neck, or any part of the bladder. Nor do diseases of the inguinal glands or testes affect in any way the urethra. The mutual sympathy however between the head, stomach, and heart, is contrary to this general rule.

C H A P. IV.

On the uses of Sympathy.

S E C T. I.

Natural Sympathies most evidently useful.

CXL.

SYMPATHIES have undoubtedly their uses, and answer very important purposes in the animal œconomy. Their utility can be most plainly discovered in the natural and healthful state of the system; or when there is not any material organic injury, but only an irregular morbid action of a sound part.

CXLI.

The sound parts most likely to produce sympathetic actions and affections, belong to the vital and other functions of the system, the constitution of which are somewhat similar,

lar, and whose operations are in a great degree dependent on each other. (XXXIV.)

CXLII.

In Section IVth of Chapter Ist, which treats of the extensive relation of sympathy to the animal œconomy, I have observed, that the prevention and cure of disease, and even the restoration of animation when apparently lost, are founded on a *VIS INSITA SYMPATHIÆ*, suited to the several purposes, and called forth by the omniscient will of Providence.

CXLIII.

Natural sympathies establish a connection between the same principle in different parts of the body; in this way simple life, and sensation, or the sensitive principle, are often preserved in a part sympathant, through the medium of a distant part sympathizing. Hence, where uncommon exertions of the natural actions of parts are wanting, the use of sympathy is often abundantly evident.

CXLIV.

CXLIV.

Some proof and illustration of this may be drawn from the effects of any uncommon irritation on the lungs, throat, or nose. When such occurs the muscles of respiration produce cough, with uncommon force, and the offending matter, whether extraneous or derived from the constitution, is thereby thrown off.

CXLV.

The sympathy becomes somewhat more complicated, when the irritation, as is most frequently the case, takes place in the lungs; then the sympathizing irritation is first transferred to the larynx or gullet, denoted by a tickling sensation of the part, which induces the muscles of respiration to sympathize in their turn, whereby coughing is produced, either to get rid of the proximate cause, whatever that may be, or the disease with its consequence, which commonly is an increased morbid secretion.

CXLVI.

An affection of the lungs, producing such irritation at the larynx, appears to me to point out the necessity of a connection some way or other between the sympathant and sympathiser. The muscles of respiration, on such an occasion, sympathize indirectly with the lungs, through the medium of the sympathizing larynx, as if the want of continuity between these muscles and the lungs rendered it impossible for any direct sympathy to take place.

CXLVII.

This complicated sympathetic connection also affords us an instance of a diseased sympathy producing a natural one; for we must consider the affection of the larynx as a diseased sympathy, while the action of the respiratory muscles is a natural sympathy: and this compound sympathy at the same time affords us a proof, that affection in the sympathant can produce action in the sympathiser. (LI. XCVI.)

CHAP. IV: SECT. II.

Diseased Sympathies less evidently useful.

CXLVIII.

It is a question curious in its nature, and interesting in its tendency, why, in real diseases partial or universal, sympathy should take place, when the affections or actions of the part sympathizing do not answer, at least apparently, any visible good to the part diseased? Such operations are not easily accounted for:

CXLIX.

The sympathies between the liver and shoulder; between the stomach and testes; and between the stomach and kidneys, tend to no apparent utility. The same may be said of the sympathy between the brain and stomach. It seems highly proper, that parts from a similarity of construction, connection, &c. should be affected by sympathy, and occasionally called into action by it; and such sympathy may be accounted for. But

the sympathies just enumerated do not seem to arise from any organic connection, as far as we anatomically know.

CL.

Though such diseased sympathies can neither be explained on the same principle as the natural sympathies, nor answer any wise purpose that we can see, it may however be observed, that in such cases the sympathiser may somewhat relieve the sympathant, though no immediate advantage is apparently derived from it; on the contrary the case may perhaps seem worse than before.

CLI.

It is worth our attention, says Mr. J. Hunter, to consider how far the sensitive sympathy will admit of a division of absolute pain; for (continues he) we may affirm, that any given quantity of absolute pain may, when diffused, become insensible, which might, when concentrated, become intolerable.

CLII.

CLII.

This idea of Mr. J. Hunter's leads me to think, that the sympathy of a sound part relieves the sympathant, or diseased part, by enduring part of that pain, which collected at the diseased part would have been insupportable, the irritability of it being necessarily increased by its morbid condition. The stomach therefore sympathizes with the testes, &c. If however it is found that pain is increased by sympathy, this theory falls to the ground.

CLIII.

Mr. J. Hunter mentions the affection of the glans penis from a disease of the bladder, as a diseased sympathy without apparent utility, and difficult of explanation. May there not however be a sympathetic connection between the glans penis and kidneys, similar to that which takes place between the larynx and muscles of respiration? To render this analogical opinion plausible at least, I shall attempt to draw a comparison between an affection of the bladder, and an affection of the lungs.

CLIV.

I will suppose, that the lungs are irritated by an acrid effusion or secretion, or by infarcted vessels. The action of coughing may give relief by expelling the one, or deterring the other. To produce therefore this necessary operation, an antecedent sympathy takes place at the larynx. It is of itself an uneasiness which the constitution would attempt to get rid of by coughing.

CLV.

In like manner, the bladder may be irritated by gravel, acrid saline urine, &c. An increased secretion of urine might relieve by expelling the one, or weakening the other. To this purpose the kidneys must be stimulated to action, to which they may probably be excited by the irritation at the glans penis; which irritation may also take off the stricture caused at the neck of the bladder by the irritating matter; and it may be further observed, in proof of this opinion, that generally an evacuation of urine takes place soon after a fit of the stone and gravel.

CLVI.

CLVI.

The parts concerned in each of the above cases of compound sympathy (CLIV. CLV.) belong to a separate and distinct function in the constitution, the diseases of which bear some analogy, and therefore their sympathies will reasonably admit of a similar explanation.

CLVII.

I have given a chapter upon inflammation when sympathetic, and when specific; yet I shall beg to throw in a question here, on that division of the subject. What can possibly be the use of a common sympathetic inflammation in one part, from a specific disease in another part? I suspect, that such inflammation, when it seizes on lymphatic glands, is intended to prevent the absorption of the specific virus. This may be illustrated by the swelling of the inguinal glands in a venereal gonorrhœa, or of the axillary glands in a cancer of the breast.

CLVIII.

This opinion is rendered probable from observing, that the lues venerea very frequently makes its appearance after a gonorrhœa has been cured, when there has been no antecedent affection of the glands of the groin; and vice versa, where the glands have swelled and been very painful, which is frequent in cases of gonorrhœa, the affection of them abates, as the original complaint goes off, and is not commonly followed by any syphilitic complaints.

CHAP. IV. SECT. III.

*What Sympathies may be applied to medicinal use,
and how.*

CLIX.

By being acquainted with the natural sympathies in the constitution, we are enabled to apply our remedies to the healing of a partial affection, on the principle of affecting the sympathant, through the medium of the sympathiser. We are also, by
such

such a knowledge of the animal œconomy, guarded against a mistake we might otherwise easily fall into, of considering a part as diseased, which in fact is only affected from sympathy with some distant diseased part.

CLX.

I shall mention a few sympathies useful to be known. An attention to the sympathy between the stomach and skin may on some occasions assist us in our practice. In obstinate vomitings the warm bath may relieve, and effectually put a stop to them. External applications of theriaca, &c. to the pit of the stomach have been attended with the same good effect. In cutaneous diseases we should remember, that the stomach may only be sympathetically affected; and that such disorders may be cured by the operation of medicines on the stomach. (CVIII.)

CLXI.

Disorders of the head frequently originate from a morbid condition of the stomach. Thus epileptic and other nervous complaints have followed too liberal an indulgence of
the

the appetite in wine, &c. leaving sometimes behind them a failure of the memory, and occasionally paralytic complaints. In such case, our remedies are to be suited to the morbid condition of the stomach.

CLXII.

A swelled testis can be cured on the principle of sympathy between it and the stomach. Thus a few grains of ipecacoanha have been known to cure such an affection. Emetics have also cured the white swelling of the knee.

CLXIII.

It has long been a received opinion, that cantharides applied to any part of the body, affect the bladder, and (as some say) exulcerate it, particularly if they stay on long. I have also read of a kind of stone, brought out of the West Indies, which was said to have a peculiar property of discharging gravel, and of dissolving the stone; insomuch that when laid to the wrist, it has so forcibly expelled urine and gravel, by its violent manner

ner of operating, that the sick person has been glad to remove it.

CLXIV.

What has long been noticed, is even to this day confirmed by frequent experience, namely, that the soles of the feet have a great affinity of consent with the head, and upper orifice of the stomach. It is generally known, that going barefooted to those that are not accustomed to it, will sometimes affect both, each with its specific complaints. These affections are often removed by hot applications to the feet, to attenuate, as the ancients used to say, the rheum. Formerly a physician, says a voluminous writer, who wished to appear mystical, prescribed for the cure of the rheum, that the patient should walk continually upon a camomile alley (such was the old language) meaning thereby that he should put camomile into his socks.

CLXV.

Again : it has occasionally been the practice to ease the head by applying to the soles of the feet fresh slain bleeding pigeons. Sinapisms are to this day frequently applied to the feet to relieve the head. Sleep is also sometimes obtained by the application of soporiferous medicines to the feet.

CLXVI.

The wrists and the hands have been supposed by some to have a sympathy with the heart. Thus, it has been observed, that the affections and passions of the heart and spirits are notably disclosed by the pulse : and long continued agues, it is said, have been cured by the application of garlick, and the like medicines, to the hands, and wrists. Eggs of alabaster, and balls of chrystal have been held in the hand, in order to appease the fury of a febrile heat. Solutions of nitre applied to the palms of the hands might, perhaps, on the same principle, answer a similar purpose.

CHAP. IV. SECT. IV.

*Sympathy, when the province of the physician, and
when of the surgeon.*

CLXVII.

Diseases with their sympathies are either local or universal. If sympathy be either particular or universal, and the cause be known, it falls under the care of the *medical* surgeon; but if the cause be not known, or if it be not even known that a cause exists, then the sympathy becomes the province of a physician, more especially if it is universal.

CLXVIII.

Local diseases in all cases come more properly under the care of the surgeon; when universal they fall under the province of the physician.

C H A P. V.

On the Sympathetic operation of medicines:

S E C T. I.

Effects of medicines, when local, and when remote.

CLXIX.

MEDICINES produce universal effects by partial operations. The sympathetic effects of medicines may be divided into two kinds; namely, those local or similar to the action of the stimulus, and those remote and particular from the nature of the sympathiser.

CLXX.

The sympathetic action will be local, when only the surrounding parts act in concert with the part stimulated. It is to be considered as remote, when the remote parts

sympa-

sympathizing have some specific connection with the part stimulated, as the stomach with the testis; head with the stomach, &c.

CLXXI.

The sympathetic operation of a medicine may be either peculiar to the mode of action of the part that sympathizes; or it is possible that it may be agreeable to the mode of action of the part stimulated.

CLXXII.

That sympathy, whose influence is similar, or which only acts topically, loses its power by distance simply, and may be called truly local; and such medicines, as produce these effects, may be classed among the local applications.

CLXXIII.

If similar and local sympathy did not assist the operation, and effects of medicines, they could have but little power to do good, as most local diseases extend some way beyond the surface of exposure, which extension it-
self

self arises from sympathy; therefore it is probable, that the sympathetic effects of medicines may also extend as far.

CLXXIV.

If this was not the case, how could a fomentation give ease to a swelled testis? for it only comes in contact with the scrotum; neither could æther, on any other principle but sympathy, cure or ease a head-ach, by being only applied to the skin of the forehead.

CLXXV.

It is well known to every one, that by applying medicines simply to the skin you may relieve inflammations, that go some depth: if it was only the surface of contact, which was stimulated, that could receive ease, in such a case the medicine would produce very little effect; but as they produce a healthy action in the surface of contact, the other neighbouring parts sympathize with it, and all are relieved in a proportionate degree.

CLXXVI.

CLXXVI.

Local and similar sympathy is certainly essential towards the giving efficacy to all external applications. For if it was necessary that the medicine should come in contact with every part that was diseased, it would be impossible for any part, diseased in this way, to be either relieved or cured.

CLXXVII.

On the other hand it is certain, that all sympathetic effects of medicines are not similar to their effects on the part of application; for we know that many medicines, when applied to some parts, shall cure, by effects on such parts, a distant part when the same medicine, applied to the diseased part, would kill. Such are the effects of many applications to the stomach, which cure pain, and other complaints of the head; but if you was to apply the same medicine to the head itself (*i. e.* to the brain) it would kill. (CLXX.)

CLXXVIII.

If therefore remote sympathy did not act in many cases upon the same principle

as local, we could not account for the effect of a fomentation, in relieving a pain of the bowels, when applied to the skin of the belly ; or in relieving a pain of the thorax, when applied to the breast.

CLXXIX.

It is also known, that there are many medicines, which cure by remote sympathy, which could have no effect when applied to the part diseased. Such is the effect of ipecacoanha applied to the stomach in curing a complaint of the testis, which, applied to the testis itself, would be of no avail. (CLXII).

CLXXX.

In the case just mentioned, the medicine is rendered capable of performing a cure by sympathy, from having produced a peculiar effect on the stomach ; so that the effect which such medicine has in the stomach, is not similar to any effect that it would be like to have, if applied to the part itself.

CHAP. V. SECT. II.

Sympathetic effects of aqueous applications to the skin.

CLXXXI.

We shall be better able to understand the foregoing theory, (*which is chiefly Mr. J. Hunter's*, and most of the arguments in the following Sections of this Chapter are to be received as his) if, by way of illustration, we contrast it with the common received explanation and opinion respecting topical applications. Their mode of operation has been generally supposed to depend upon their entering the pores of the skin, and being, by such channels, conveyed to the parts affected. Hence arose the expression, “Such a medicine is penetrating.”

CLXXXII.

Let us in the next place see, how physicians have established their mode of practice upon this mechanical idea. To inflammations they order fomentations to be applied as hot as they can be borne, because warmth and moisture penetrate. The pores are thereby opened, and the moisture is supposed to pass in; but if we reflect for a moment, we

shall know, that the parts beyond the surface of contact cannot be made moister than they naturally are.

CLXXXIII.

It is upon the same principle, that people labouring under dislocations, ruptures, &c. are ordered to be put into the warm bath, or have fomentations applied to the injured parts; for there is no doubt; but that the relaxation of the parts morbidly affected would be very salutary and beneficial in such cases, if it could be accomplished; and nothing has hitherto been considered so effectual, towards attaining such an end, as warmth and moisture.

CLXXXIV.

A piece of dried meat, says Mr. J. Hunter, or dried leather, may be affected in this way, but a dead body, that has as yet undergone no such change, cannot; much less a living one. “A man, says he, meets with a dislocation, he is ordered to be put into warm water to be relaxed; now it is morally impossible (continues he) that the
warm

warm water can relax by adding moisture to the body : not a drop of water can possibly pass into the joint. The ligaments will not become a bit moister, though you was to soak him to eternity.”

CLXXXV.

It becomes then a question ; Do these applications ever do good ? Mr. J. Hunter allows they do, but upon the principle of sympathy. The surface of contact is by their operation lulled or soothed, and the irritability either of the whole, or part, of the diseased affection is put to rest. This acquired diminution of partial excitement allows us, where violence is to be used, as for instance in a dislocation, to use it more freely than before.

CLXXXVI.

Irritation is often removed upon the principle of remote sympathy. Thus a man is put into a warm bath for a suppression of urine. Surely, warm water, for the purpose of penetrating simply, cannot in such a case be necessary ! How then does it act ?

It acts upon the same general principle of sympathy. The whole body is put to rest by the irritability of the skin being soothed, by which means the suppression, from the irritation at the neck of the bladder being taken off, is removed, or in some measure relieved.

CHAP. V. SECT. III.

How unctuous and volatile applications by Sympathy increase motion.

CLXXXVII.

Volatile substances (says Mr. J. Hunter) are also frequently recommended upon the same supposed principle of their being penetrating. But it is well known, that bodies in vapour are not so penetrating, as the same bodies in the fluid form. Neither air, nor the steam of hot water will pass, where water alone will pass readily. Hence the operation of volatile substances is assisted by sympathy.

CLXXXVIII.

Oils have been recommended in the way of friction, upon the same mechanical principle

ple of being penetrating ; and two purposes were meant to be answered by them ; first, the giving of motion, and secondly, their procuring resolution. The mild and soft oils have been recommended for the first intention : and this idea of the medical utility of oil must have arisen from its answering so well in making an old hinge go easy, or an old boot fit easy.

CLXXXIX.

Unfortunate for the animal body, which labors under the want of any free motion, oil cannot penetrate beyond the surface to affect mechanically the inward parts, even supposing in other respects the mechanical construction the same ; for an animal is moist or wet in all its internal parts. Therefore oil cannot possibly touch any internal part of an animal body. Fortunately for the hinge, oil may penetrate into all its moving apparatus.

CXC.

Animal oils have been commonly most esteemed, and preferred to the vegetable,

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because,

because, having come from an animal, it was thought they might more readily enter one again. Good effects are no doubt obtained from the use of such outward applications, but they most probably arise solely from the mechanical motion used in the application of them.

CHAP. V. SECT. IV.

How unctuous and volatile applications procure resolution.

CXCI.

The second intention, for which such applications have been recommended, is to procure resolution; to answer this indication the warmer and essential oils have been in general used. The same objections hold against their penetrating, as were made against the operation of the mild oils. Therefore whatever may be the medicinal quality they possess, it must depend upon their stimulating power operating upon the part of application, and producing its consequent sympathy.

CXCII.

CXCII.

A greater and more certain benefit may however arise from local applications of the stimulating kind, than what can be procured either from the stimulus they produce on the skin, or from their sympathetic effects: for though we do not allow of their having any mechanical penetration, yet we may be obliged to admit of their operation by absorption, which in many cases may have considerable effects.

CXCIII.

If an external remedy be so applied, that the absorbents passing through the diseased part, necessarily take it up, it may considerably affect the disease in its road to the circulation; for the medicine will be thus applied to the diseased absorbents; and as experiments have demonstrated, that absorbent vessels are very irritable, so the sympathy, which arises from the operation of the medicine on them, may be more immediate, than from its operation simply on the skin.

CXCIV.

CXCIV.

Mercury is the specific remedy for the venereal disease. When a gland in the groin swells, it is the common practice to rub the swelled part with some mercurial ointment. It is probable however, in such a case, that the effect is only produced by sympathy, from the stimulus of the remedy on the skin: for the absorbents at the part of application in all probability do not pass through the swelled gland.

CXCV.

Moreover, the quantity of the medicine absorbed, from so small a surface, can have no very great effect. In order then to produce a more considerable effect it is proper to apply the mercurial preparation to the leg or inside of the thigh, which seldom fails of procuring the desired effect.

CXCVI.

The success of such applications on diseased absorbents cannot attend other indurated glandular parts, that are not absorbent. Therefore the advantage derived from a similar practice in these cases must arise
from

from the application of the remedy to the part affected, by its sympathetic operation, from the stimulus afforded by it to the skin.

CXCVII.

With respect to all outward applications for the purpose either of increasing motion or procuring resolution, it may be observed, that the mechanical effect which arises from them is different from their mechanical effect on a hinge. Upon such their action is immediate, by immediately altering the condition of the parts, which was the cause of the stiffness. But their mechanical operation on a living body acts only as a stimulus to the parts. By acting thus as a stimulus to the external parts, they increase their action, and make also the neighbouring and more-deep-seated parts act by consort in a similar manner, till by this compound action the parts of themselves become capable of removing those obstructions, which had existed as the impediment to their free motion, and as the cause of induration.

CXCVIII.

CXCVIII.

I cannot conclude this chapter without taking some notice of the operation of internal medicines. Their salutary effects are often so quickly obtained, at distant parts of the body, when the medicine cannot possibly have been directly applied to them, that no other way is left to account for their sudden manner of relieving, but on the principle of the sympathy of the stomach with the whole of the animal machine. It is in this way that we must explain the sudden good effects of Peruvian bark, in preventing the accession of an intermittent paroxysm : and it is on the same principle that a strong opiate will stop the further progress of the paroxysm, though the cold stage has already commenced. I have frequently made trial of this mode of practice. An increased perspiration is also caused by nauseating doses of antimonials from sympathy of parts.

CXCIX.

It will however still remain a question, what are the minute parts of the stomach,
which

which are immediately acted upon by medicines? The sentient extremities of the nerves may very reasonably be supposed to be concerned in their operation; however I shall have occasion to treat of this subject more at large in the second part of the work, when I shall endeavour to make it clear, that extreme vessels, from their sensibility and natural connection, are most likely to become the channels of *Medical Sympathy*, through the medium of the sympathising heart: and that this *vascular sympathy* is particularly founded on a *balance and connection between the external and internal extreme vessels*, more especially those of the STOMACH.

C H A P. VI.

On the Sympathy of the senses, and force of imagination.

S E C T. I.

On the Sympathies produced by the passions and affections of the mind.

CC.

SYMPATHY “relates both to the operations of the affections, and to those of the imagination :” these are often so much connected, that they have generally been treated of together. It is impossible indeed to consider the affections of all the senses, without admitting the *force of imagination* to be often materially concerned. I intend however to confine my remarks chiefly to those affections and operations, which are not entirely regulated by its influence, and power.

CCI.

I cannot however proceed with this part of my work, without expressing a hope, that it will not be considered as foreign and unnecessary to the plan of my present undertaking. I view it as a *proper medical enquiry*, to speak of whatever may concern the qualities and passions of the mind, and affections of the senses, in as far as, by their operations, they may affect and alter the corporeal *flamina* of man. The various temperaments are materially concerned in the state and condition of the mind, and therefore I hold it useful, to be well acquainted with the changes that may be produced in the body, through the sensations and affections of the mind.

,CCII.

The passions and affections of the mind produce in the body different sensations and impressions, and as sympathies of consciousness determine in general the spirits to those parts, which labor most, or are most to be affected. “ Thus *fear* and *anger* determine to
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the heart; *lust* to the eyes, &c. *joy*, *pity*, *wonder*, and the like, to the head. This observation may be of great use."

CCIII.

The passions and affections have been said to impress, and act upon, the body, in the following manner: "1. FEAR causeth paleness, trembling, the standing of the hair upright, starting, and screeching. 2. GRIEF and PAIN causeth sighing, sobbing, groaning, screaming, and roaring: THEY also cause tears, distorting of the face, grinding of the teeth and sweating. 3. JOY causeth a cheerfulness and vigour in the eyes, singing, leaping, dancing, and sometimes tears. 4. ANGER produces paleness in some, and the going and coming of the colour in others: also trembling in some, swelling, foaming at the mouth, stamping, and bending of the fist. 5. SLIGHT DISPLEASURE OR DISLIKE causes shaking of the head, frowning, and knitting of the brows. 6. SHAME causeth blushing, and casting down of the eyes. 7. PITY causes sometimes tears, and a flexion or cast
of

of the eyes aside. 7. WONDER causeth astonishment, and an immoveable posture of the body, casting up of the eyes to heaven, and lifting up of the hands. 9. LAUGHING, though hardly to be considered as a passion, since it is produced by an affection of the mind, causeth a dilatation of the mouth and lips; a continued expulsion of the breath; with a loud noise, which maketh the interjection of laughing, shaking of the breast, and sides, and running of the eyes with water, if it be violent and continued. 10. LUST causes a flagrancy in the eyes, and priapism."

CCIV.

The affections of the mind of one person will often work upon the spirits of many. Thus whole companies are sometimes disposed to be sad and melancholy, or merry and jovial, when any one is present much inclined to either of those states of mind; and it has been observed, that old people, who have loved the company of the young, and have been conversant continually with

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them,

them, have generally lived long. But young people must not conclude from this, that the company and conversation of the grave and old will operate upon their *simple* life, and sensitive principle, through the affections of their mind, and dispose them to be short-lived. On the contrary, by thus improving their understanding, they will be more enabled to fortify their constitution, and resist the ravages of youthful indulgence.

CCV.

It may also be further observed, that those tender sympathetic affections, which lay hold of the mind, at the representation of theatrical performances, originate from the same principle, while they are to be considered as the surest test of just execution in the actor, and of the expressive language of the author. Indeed all *stage effect* depends on sympathy.

CCVI.

The affections of the mind make the spirits more powerful and active, especially those which manifest themselves by the eyes.

eyes. Two in particular may be named, LOVE and ENVY. As sympathies of consciousness their operations are more easily felt than described. Though opposite in their nature, they are equally violent in obtaining their particular ends. The one can no more suffer indifference and disappointment, than the other contempt and haughtiness.

CCVII.

It has been said, that the passions of the mind are occasionally infective, particularly some of them. Thus FEAR and SHAME are sometimes very suddenly so. We frequently may have occasion to see, that the starting of one will make another ready to start. Again, when one man is out of countenance in company, others will often blush in his behalf. However, the serious passions may *surely* be so under the controul of reason, as to resist infection, whatever may be the case of *temporary muscular or nervous attraction*.

CCVIII.

I think there is much reason to suspect, that a connection between the affections and sensations of the female mind and uterus is very materially concerned in the process of generation, and probably can alone give efficacy to those actions and impressions subservient to conception, through the sympathizing affections of the mind. I speak of this generative principle as an universal one, and wish it not to be considered, as belonging solely to rational beings. Such an influence may have been given to all animated nature.

CCIX.

One of the first medical philosophers of the present time is of opinion, that the mother has always the powers and principles of fashioning her child within herself, but that they are not roused to action without the stimulating influence of the male. The principles that must be immediately concerned are the sentient and living, but it is through the influence of the mental principle, that
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the form and image of the embryo is stamped:

CCX.

With respect to the depravity and force of the imagination, in the production of sympathies, they always operate most upon “weak minds and spirits, and therefore most on women, superstitious and fearful persons, sick people, children, and young creatures.” “Their effects however sometimes fail to appear, because they are encountered and overcome by the mind and spirit, before they work any manifest effects.”

CCXI.

Such effects are obviated upon the same principle, which establishes the prevention of bodily disease: “for in infection and contagion from body to body (as for example, during the plague) the miasma may be received, but from the strength and good disposition of the body, it is expelled and wrought out, before it has had sufficient time to form the disease.”

CCXII.

It has been said, and many are of the opinion, that the force of imagination doth often forward the end proposed. Thus for instance, it has been put as a question, “whether a man, when he constantly and strongly believes that such a thing shall be (as that such a one will love him, and the like) helps any thing to the effecting the thing desired?” Certainly not in the manner which has been advanced, namely, “by a *secret operation* on the spirit of another.” If he succeeds, it is either because he persevered, or because his *perseverance and earnestness* (and not any *occult operation*) makes him at length be attended to.

CCXIII.

There is not a doubt, but the *force of imagination* often gives energy to our actions. It may however, unless we are much on our guard, easily delude us aside from reason. It has been the *tree* which has yielded the fruits of superstition in former times, and which has often fed the human mind
with

with the most extravagant notions of sympathy. Sympathies of this kind, *such as the power of charms, and the like*, are now pretty generally exploded.

CHAP. VI. SECT. II.

On the Sympathetic affections of the external senses.

CCXIV.

The five principal senses, *hearing, tasting, smelling, feeling, and seeing*, are conscious of a sympathetic impression from odious objects.

“ 1. A disagreeable sound will set the teeth on edge, and make all the body shiver. 2. The swallowing of a nauseous medicine will be attended with a shaking of the head and neck. 3. Disagreeable smells produce nearly the same effect, which are less perceived, because there is a remedy at hand by stopping the nose. 4. If you come suddenly out of the sun into the shade, the sense of feeling is disturbed by a chilliness, or shivering of the whole body. 5. And even sudden darkness produces a propensity to shivering.”

CCXV.

There is a very apparent reason why a sympathy should take place between the eyes. Hence their motions are synchronous. It may be said, that custom and habit dispose the eyes to move one and the same way; “for when one eye moveth towards the nose, the other eye moveth from the nose.”

CCXVI.

Though the eyes are by nature prone to move in concert, custom will however destroy this natural consent, and produce the contrary. Thus some people will squint when they will. I would therefore give this caution to mothers and nurses: “let them not suffer infants to sit with a candle placed behind them, for both their eyes will dispose to move outwards, as affecting to see the light of the candle, which may bring on the habit of squinting.”

CCXVII.

It appears as a quality in the senses of *bearing* and *seeing*, “that the instrument of
each

each separate sense has a sympathy and similitude to that, which giveth the reflection." Thus it has been observed, "that the eye will sympathize with a chrystal glass, or water, and the ear with caves and such hollow places as are suited to report echo."

CCXVIII.

Sympathies have been compared to *unisons of sound* in music. (LVIII.) Unisons of sound produce agreeable, sympathetic feelings; the reverse produce disagreeable feelings, (CCXIV.) "All concords and discords of music are (no doubt) sympathies and antipathies of sound." Moreover, "they are said to work as well by report of sound as by motion."

CCXIX.

The sense of *feeling* may be disturbed by any uncommon, though apparently slight, irritation. Thus tickling the sides, or soles of the feet, will cause *laughter*: and again, tickling the nostrils will raise *sneezing*, and on a sudden wonderfully increase the secretion of tears. Both these *operations*, as sympathies,

thies, tend to remove both cause and effect, “by producing a sudden emission of the spirits,” and the expulsion (if there should be any) of the offending matter.

CCXX.

The most agreeable as well as odious objects operate in a secondary way, in producing those sympathetic impressions and actions, which they commonly give rise to. An increased secretion of *saliva* often takes place at the sight of a favourite dish: and the running of water from a bottle, or otherways, will sometimes affect individuals, of a particular idiosyncrasy, with an involuntary propensity to void urine.

CHAP. VI. SECT. III.

On the secret effects of Sympathy and Antipathy on the child in the womb.

CCXXI.

I have frequently had occasion to mention the great sympathy which, in various states of the animal machine, is discovered
between

between the uterus and other important parts of the body, such as the heart, stomach, and head. Therefore the secret effects of sympathy and antipathy on the child in utero should not be passed over unnoticed, notwithstanding it has been said in a former chapter that a child in utero is to be considered as a more simple animal than a polypus. (LXIII. LXVI.)

CCXXII.

I shall first lay before my reader the opinion of the very learned Bacon on this interesting subject. “It has been observed (says he) that the diet of a woman with child doth work much upon the infant; as if the mother eat quinces much, and coriander seed (the nature of both which is to repress and stay vapours that ascend to the brain) it will make the child ingenious; and on the contrary side, if the mother eat (much of) onions, or beans, or such vapourish food; or drink wine, or strong beer immoderately; or fast much; or be given to much musing; (all which send or draw vapours to the head) it endangereth the child to become
lunatic,

lunatic, or of imperfect memory; and I make the same judgment of tobacco often taken by the mother." Particular cases may have, no doubt, occurred in support of some of these opinions:

CCXXIII.

There is too good reason to imagine, that much injury may be done to the child in the womb, by the imprudent conduct of the mother, though sometimes innocently through her ignorance; and if things taken into the stomach can so materially affect the unborn babe, is it not worth our while seriously and minutely to attend to the subject, in order to discover what may particularly advantage, or what may particularly prejudice, the child in utero, in order that we may conscientiously set about to obtain the one, or guard against the other?

CCXXIV.

Unborn children, though considered as simple animals, are no doubt liable to both acute and chronic diseases, which prove often
fatal

fatal to them. They are probably brought about by some defect in the living principle belonging to the circulating and muscular systems, which together constitute so considerable and essential a part of the animal machine. I cannot consider them as under the influence of either the sentient or mental principles. It is on this ground, that I think they are to be looked upon as simple animals.

CCXXV.

If I take the liberty of setting aside the necessity of either a sentient or mental principle before birth, and of thinking the living principle, or simple life, is alone concerned in the animal œconomy of an unborn babe, it is owing to the following fact; that children in utero, whose configurations deprive them of nervous influence, namely, such as want both brain and spinal marrow, are as well grown in every other respect, and have the same quantity of motions before birth, as perfect and well formed children. This fact clearly proves that the muscular system
has

has certainly a principle of motion, independent of nervous connection.

CHAP. VI. SECT. IV.

Sympathy sometimes disorders, and throws into confusion, the œconomy of human life.

CCXXVI.

Sympathy will often raise actions and affections, in direct contradiction to the established law of the animal œconomy, that is, she will act against herself, and produce disorder in, when she ought to preserve the equilibrium of, the animal functions. She then injudiciously becomes an imitative faculty, from the acuteness of her sensibility, and in this way injures the habitation, which she was appointed particularly to preside over and preserve. Viewing her in this light we must consider her operations as inordinate and diseased.

CCXXVII.

In order to illustrate what I mean, I shall enumerate a few striking instances of such
sym-

sympathies, as appear to me to be consistent with the above sentiment, and which, in my opinion, cannot be viewed in any other light.

CCXXVIII.

The falling into epileptic and hysteric convulsions on any slight alarm, or at the relation of an affecting story, appear to me to be inconsistent with *natural sympathy*, and an affront to the dignity of human nature ; when the same takes place at the sight of a distressed and suffering object, I view them as those inordinate actions, which arise from the weakness of human nature, at a time when she ought to command ability and strength of reason, to have assisted in the distress she had just been witness to, and not have exposed herself to the necessity of receiving the same, if not greater assistance, from others.

CCXXIX.

I am inclined to place under the same head of sympathy, as an *irregular imitative faculty*,

culty, those inordinate convulsive actions, which arise in one, or many persons, on seeing another in the agony of an epileptic paroxysm. Frequent instances occur of knowing that individuals may thus be sympathetically affected; but the instances are rare, where the affections of many are at the same time similarly operated upon by imitation. A noted instance of this once occurred at Haerlem Hospital in Holland, where many of the same ward were seized with epileptic fits, as soon as the patient, who had been admitted for them, was seized with his.

CCXXX.

Again, it has been already said, that the force of imagination operates most on weak minds and spirits, and therefore most on women, &c. (CCX.) Such, from a similar reason, are also most readily influenced by tender and sympathetic feelings. It is on this principle, that pregnant women, when they are witnesses to the pangs of labour in another woman, very commonly will

will complain of feeling those pains, which are peculiar to the process of parturition; and I have been further told, and believe it to be true, that premature labour has been brought on, on the same occasion, when it could only be accounted for, upon the supposed influence and authority of *imitative sympathy*. In short, we are such sympathizing creatures, that we must every now and then be exposed to all the ill consequences of idiopathic disease, owing to the power of sympathy.

CCXXXI.

I cannot conclude the subject without observing that the influence of sympathy even extends itself to the inanimate part of nature. Plants, metals, &c. sympathize with each other. The whole world was formerly supposed by the ancients to sympathize in all its parts. Their doctrines were however carried too far, and built upon superstitious principles, though they were occasionally supported by many operations on the earth, and attractions between certain

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parts

parts which constitute it, and which were supposed to make, by consent of the universe, part of the diurnal revolution.

CCXXXII.

Human nature herself may be considered as a *microcosm*, and is certainly regulated by the primitive laws and influences of the animal œconomy. Thus we, after the like manner, observe, that alternate sleep and watching, satiety and hunger, constitute, though in part only, and by the consent of human nature, the diurnal revolution of the animal œconomy.

CCXXXIII.

We cannot, in short, enquire into any part of animate or inanimate nature, without discovering the universality of sympathy and consent through all her operations. The attraction and cohesion of bodies in general amount to the same general principle, and point out to us, that through all nature sympathy is the universal bond of union: she has stamped her empire indelible on the mind of man, *by actions complicated, affections wonderful,*

wonderful, impressions innumerable, daily improving, strengthening, varying, and increasing: neither is she less to be admired where she has directed, as by instinct, the œconomy of the brute creation; and when, by her attractive operations, she affects and alters inanimate matter, she then confirms her universal dominion.

CCXXXIV.

SHAKESPEARE knew well the power of sympathy and antipathy over the constitution of man, when he made *Shylock* exclaim,

- “ Some men there are like not a gaping pig ;
 “ Some, that are mad, when they behold a cat ;
 “ And others, when the bag-pipe sings i’t’h’ nose,
 “ Cannot contain their urine ; for affection,
 “ Masterless passion ! sways it to the mood
 “ Of what it likes or loathes.”

MERCHANT OF VENICE.

END of the FIRST PART.

A
T R E A T I S E
O N
S Y M P A T H Y.

PART THE SECOND.

ON FEBRILE SYMPATHY and CONSENT; and on
BALLANCE and CONNECTION of EXTREME
VESSELS, illustrated by *Practical Remarks*, and
a new Explanation of the various Affections
of the Stomach and Skin in Fever.

IN WHICH IS ATTEMPTED

A full Refutation of the Doctrine delivered on
the same Subject from the Practical Chair at
the UNIVERSITY of EDINBURGH.

ON
FEBRILE SYMPATHY
AND
CONSENT, &c.

CHAP. I.

A concise view of the Theory of Fever.

SECT. I.

*The author's original letter to Dr. Cullen, and the
Doctor's answer to it.*

CCXXXV.

BEFORE I enter upon the consideration of the subject intended for the following part of the work, I think it proper for several reasons, as well as respectful to my friend and master Dr. Cullen, to lay be-

fore my reader an exact copy of the original letter, which I sent to Dr. Cullen in Nov. 1777, and of his obliging answer. I had been induced to transmit my sentiments to him *in writing*, in consequence of his having invited, from the professorial chair the preceding morning, his hearers, (among whom I was then one) freely to communicate their thoughts on, and objections to, any part of his newly advanced Doctrine of Fever, he having preferred *that mode* to a personal conversation, for which, he said, he could not command leisure.

(C O P Y.)

“ S I R, *Edinburgh, Nov. 30, 1777.*

When I heard your very ingenious explanation of the Sympathy and Consent between the muscular fibres of the stomach, and the vessels on the surface of the body, which take place in fever, it occurred to me, that such might depend upon an atony and spasm in the superficial vessels of the stomach itself.”

“ It

“ It appears to me not less consistent with your doctrines, and equally so with the laws of the animal œconomy, to suppose, that the consent should take place *between vessels and vessels*, rather than between vessels and muscular fibres. I would therefore refer the atony of the stomach, corresponding to the atony on the surface of the body, to the minute vessels on its surface corresponding to the state of the minute vessels terminating at the skin, from which would arise a mutual and proportionate spasm, if the debility be considerable enough to produce it.”

“ If such be probable, I would humbly offer it as my opinion, that the action of vomiting is *solely* the effort of the vis medicatrix naturæ, operating to overcome the spasm and obstruction in, and increase the action of, its superficial and secretory vessels, to the same end that the action of the heart and arterious system is increased, in order to remove the spasm at the surface of the body, namely,

namely, the spasm of the extreme vessels there terminating.”

“ I further presume, Sir, to imagine, that the arguments which you have made use of in the XLIII paragraph of your FIRST LINES to prove the consent as you have laid it down, will equally explain and illustrate the above supposed vascular connection.”

“ I have taken the liberty, Sir, of communicating my thoughts to you in a letter, because I think I shall be less troublesome to you in this manner, than I should have been by having done it in personal conversation, for which, as you publicly declared from the chair, you have no leisure.”

“ I have the honour to remain, with the greatest respect,

S I R,

To Dr. Cullen, Your much obliged,
Mint, Edinburgh. very humble servant,

SEQUIN HENRY JACKSON.”

CCXXXVI.

The foregoing letter of Nov. 30, 1777, remained unnoticed till July 20, 1778, on which day I received the following answer to it, but not without having troubled Dr. Cullen, a few days before, with fresh application by letter.

(C O P Y.)

“ Dear Sir, *Edinburgh, July, 20, 1778.*

On the other page I have given you shortly my opinion of your doctrine, and I would have you view it, as I would have all my opinions viewed, as given with great diffidence, and to be submitted by me patiently to the judgment of every body else.”

“ Wishing you success in all your ingenious speculations, and every part of your studies, I am with regard,

S I R,

Your faithful and

obedient servant,

WILLIAM CULLEN.”

Second

Second Page of Dr. Cullen's Letter.

“ When I suppose there is a consent between the stomach and surface of the body, I suppose it is a consent between *the muscular fibres of the stomach, and the muscular fibres in the vessels on the surface*, and such consent is not unusual in the animal œconomy.”

“ I cannot allow that the *vessels of the stomach* have any concern in this matter, as the phænomena of appetite and vomiting cannot, in my opinion, be referred to any state of the vessels, but must be to the fibres in the muscular coat of the stomach.”

“ That the muscular fibres in the vessels on the surface of the body may have a consent with the muscular fibres of the stomach, appear to me sufficiently probable from hence, that the muscular fibres of these vessels are affected by various states of the nervous system, as particularly appears from
their

their being affected by the passions of the mind."

WILLIAM CULLEN."

To Dr. S. Henry Jackson,
Broughton, near Edinburgh.

CCXXXVII.

After receiving this letter, I felt myself somewhat discouraged from indulging *my* speculations on the subject any longer; but my turbulent spirit for enquiry into the philosophy of medicine still kept the ascendancy over me, and would not suffer me to rest long; so that during the following winter, after having more attentively considered Dr. Cullen's doctrines, I engaged in preparing the following part of this treatise, which has since then received very few additions, and has of late only undergone a new arrangement of its parts. I have brought the period of *viewing Dr. Cullen's doctrines* to a conclusion *with great diffidence*, having at last, but not without struggles, surmounted that timidity, which has hitherto delayed the publication
of

of my treatise. I shall now commence the subject of fever.

CHAP. I. SECT. II.

Of the Phænomena of Fevers.

CCXXXVIII.

The phænomena of fevers are so various and numerous, and at the same time so necessarily connected together, that while I confine my attention to the investigating the morbid febrile condition of the function of the stomach; it will no doubt appear to most at first view, that I must have passed over many important circumstances connected with the doctrine of fever.

CCXXXIX.

No part of the pathology of fever appears to me so imperfectly understood; *or more difficult of investigation*, than the one I am about to engage in. Most of the other phænomena have been of late years very satisfactorily explained by Dr. Cullen, *our* learned professor
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in the University of Edinburgh, agreeably to his own system; but I have always thought, that his explanation of the febrile state of the stomach, though extremely ingenious, was deficient: in considering therefore the subject in hand, I shall unavoidably be led to offer my objections to that part of his system, which treats of the sympathy and consent of the stomach and skin in fever.

CCXL.

When I am obliged to differ from such great authority, I do it with fear and diffidence; and yet from a firm persuasion, that any attempt, however feeble, to elucidate a difficult subject, will be received with candour by the learned, I enter on it with pleasure, and will pursue it with freedom.

CCXLI.

Though I mean to confine my reflections more particularly to an illustration of the more common effects produced on the stomach by the febrile state of the system, yet
I think

I think there is a necessity of being more particular at first, and therefore, before I enter on the particular subject intended for these sheets, I propose briefly to premise two others as preparatory, and on which the explanation in view will be founded; I mean *the pathology of fever*, and *physiology of the stomach*: these must, at first sight, appear necessary, as they constitute the basis on which I am to raise my future fabric, and without which, it is probable, some of my readers might be at a loss to discover the proper application of the reasoning I am hereafter to make use of.

CCXLII.

Fever is a state of the system characterized by the following circumstances.

After an almost imperceptible diminution of strength in the animal functions, there comes on some degree of cold shivering, followed by an increase of heat, an increased frequency of pulse, and increase of the general debility; and though fevers, on some
occa-

occasions, put on different appearances with respect to the accession and duration of the phænomena, yet I think there is one general cause acting in the production of all.

CCXLIII.

By the modern pathologists the paroxysm of a fever, ex. gr. an intermittent, has been (I think justly) divided into three stages or periods, to wit, the *cold*, the *hot*, and the *sweating*: each of these may be said to be characterized by its peculiar phænomena, which are certain occurrences in the course of the disease, constituting when taken together the whole of the paroxysm. These phænomena I shall briefly enumerate, and mention them as they occur in the series of cause and effect, i. e. in the order of the cold, hot, and sweating stages. I begin then by the cold stage.

CCXLIV.

1. At the commencement of the cold stage, the pulse may be observed to be slower, and weaker than natural; as it increases,

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the pulse becomes smaller, very frequent, and often irregular.

2. The respiration is small, frequent, and anxious, and a short dry cough is sometimes attendant on it.

3. The function of the stomach is much disturbed with anorexia, nausea, and vomitio, in other words, want of appetite, sickness, and vomiting.

4. There is much thirst, and the mouth and fauces are dry and clammy.

5. The urine is almost colorless without cloud or sediment.

6. The alvine discharge is commonly impeded; or if there be an evacuation of fœces during the cold stage, they are more costive and dry, than during the health of the system.

7. If

7. If there are tumours on the surface of the body, they are observed, at this time, to be considerably diminished; and ulcers have also been dried up during the cold stage. (This last phænomenon there are frequent opportunities of seeing in persons who have lately applied a blister to any part of the body, or who have issues, setons, &c.)

8. The sensibility of the body is often greatly impaired.

9. There is a difficulty of recollection more or less through the whole of the paroxysm, often arising to delirium.

10. Sleep and drowsiness will sometimes attend this stage, often to the degree of coma.

11. A head-ach is sometimes felt early in the cold stage, with pains in the back, and there are more or less of general pains in all the flesh and joints; these changes in the various functions of the system constitute the

cold stage, which is of longer or shorter duration according to the nature and type of the fever.

CCXLV.

The cold stage gradually and indeed sometimes pretty suddenly changes into the hot stage ; this is characterized by the following phænomena:

1. From being slow, weak, and irregular, the pulse has become more regular, hard, and full, and in these respects increases till the sweat flows; (from the increased action of the heart and arterious system, the pulse in fever runs further along it than at other times, and hence a pulsation is sometimes to be felt at the tips of the finger. This is very remarkable in child-bed fevers, and when considerable is a dreadful symptom.)

2. The respiration is now more full and free, but still frequent and anxious, with some continuation of cough.

3. The

3. The anorexia still continues, and the vomiting will sometimes be violent at the beginning of this stage, but abates as it advances.

4. The thirst continues from the heat now prevailing.

5. The urine becomes high colored, but still continues without sediment.

6. The belly still remains bound.

7. Tumours are yet sometimes diminished, and ulcers still dry.

8. The sensibility is now recovered, and is often considerably encreased.

9. The head-ach, though sometimes felt early *in the cold stage*, more commonly is not felt *till the hot stage* be formed, and then it is usually attended with a throbbing of the temples. When the head-ach comes on, whether *sooner or later*, there are generally pains in the back or some of the great joints.

This stage has no limited duration, and by insensible degrees changes into the following, viz. the sweating stage.

CCXLVI.

In this stage the changes that occur in the various functions of the body are striking.

1. The pulse is now become softer and less frequent, and when the sweat ceases returns to its natural standard.

2. The anxiety in the respiration is relieved, and it is now less frequent and freer, and unaccompanied with cough.

3. There is most commonly a total cessation of the nausea and vomiting.

4. The mouth becomes moister, and the thirst gradually abates.

5. The urine now deposits a sediment, commonly lateritious, the sweat having flowed freely,

6. Till

6. Till towards the end of the paroxysm stools seldom occur, and are commonly after the first evacuation lax.

7. Tumours on the body are now increased, and ulcers will again discharge matter.

8. And, lastly, there is an abatement of the head-ach, and pains of the back and joints; and when the sweat goes off they commonly cease all together.

CCXLVII.

Sympathy, in my opinion, lays the foundation of these various changes; (CCXLIV. CCXLV. CCXLVI.) parts similar sympathize at one and the same time with the stomach, *the grand sympathiser, and fountain of sympathy* (Part the First, Chap. II. Sect. V.). By the state of this viscus, as a secreting organ, is regulated the state of all the other secreting organs in the system, as will, I flatter myself, evidently appear in the course of the subsequent pages. If then

it can be made to appear, that such influence may be allowed to the stomach over the constitution at large, there is just room to suspect, that the proximate cause of the whole phænomena first takes place in the stomach: allowing that some of the principal remote causes of fever are capable of primarily acting, from their nature, on the stomach, which I think they may do. Hence arises its first derangement, of which impaired appetite generally gives the alarm.

CCXLVIII.

Fevers have been divided into the intermittent and continued; and this division has a real foundation. There are others called remittent, but these are not readily comprehended. For a particular account of these varieties, and their origin, I beg leave to refer the reader to Dr. Cullen's First Lines on the Practice of Physic, page 18 to page 24 *. It is unnecessary to the particular subject in view to dwell longer on this part of the pathology; I shall therefore

* See also his Chapter on the Difference of Fevers and its causes, page 47 of the First Lines.

fore proceed to consider the immediate and efficient cause of the forementioned chain of phænomena.

CHAP. I. SECT. III.

Of the proximate cause of Fever.

CCXLIX.

Proximate causes have always been a favourite pursuit with medical philosophers; and though the *hypotheses* founded upon them sometimes want support, they may still be considered, in as far as they may tend to illustrate the subject, as useful delusions. There seems to be, in my opinion, great improvement made in this part of the subject by the attentive observations of Dr. Cullen, who has justly laid aside the former doctrines of *Lentor* and *Visciditv*, and of *morbific Matter*, and has adopted a system of his own more consistent with the phænomena of fever.

CCL.

This learned professor's idea of fever is as follows ; " That a spasm of the extreme vessels, however induced, may prove an irritation to the heart and arteries," and that such is to be considered as a principal part in the proximate cause of fever. (Dr. Cullen's First Lines, paragraph XL.) But moreover, " he is led to believe, that, together with the spasm, there is an atony subsisting in the extreme vessels, and supporting the spasm affecting them." (First Lines, par. XLII.)

CCLI.

For some illustration and proof of this doctrine I must refer my reader to his Chap. on the Proximate Cause of Fever (page 24 of First Lines). Dr. Cullen however observes, " that it will still remain a question, what is the cause of this spasm, whether it be directly produced by the remote causes of fever, or if it be only a part of the operation of the vis medicatrix naturæ." (F. L. par. XL.) He is disposed to be of the latter opinion. Resting then satisfied with this short account of
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the proximate cause, I shall next consider the remote causes.

CHAP. I. SECT. IV.

Of the remote causes of Fever.

CC.LII.

The operation of these appears to me to be still involved in some obscurity. Dr. Cullen has hinted it as a doubt, whether they act directly in producing the spasm. (CCLI.) I cannot but entertain a confused notion, that they may act topically, both on the sentient extremities of the nerves, and the extreme vessels of the skin at the same time, and in this way, by producing the atony, lay the foundation of fever: and as they are not all of the same nature, and do not possess the same specific properties, so some more readily may produce bad effects externally, others on the contrary, internally. (Last Part of CCLXVII.)

CCLIII.

Dr. Cullen speaks thus of the action of stimulant and sedative powers upon extreme vessels:

vessels: “The tone and action of the arteries, as a muscular part, may be increased by stimuli immediately applied to them, or by the increased force of the nervous and animal powers with regard to them; and they may be diminished by sedative powers applied to them, or by weakening the nervous and animal powers.” (Cul. Phys. par. CLX.) On such principle some of the remote causes of fever seem to me to act.

CCLIV.

The principal remote causes of fever are, contagion, miasmata, and cold: and I beg leave to add, excess, or imprudent indulgence, of the appetite. Occasionally fear has been known to throw the system into a febrile state; they have all been considered as of a sedative nature, though cold is well known to have both stimulant and tonic effects on some occasions. Whatever their operation may be, they (fear excepted) seem to me as likely to act topically as in any other way, and I am inclined to consider both the general debility, and subsequent re-action of the

the system, as effects of the operation of the vis medicatrix naturæ, agreeable to some established law in the animal œconomy.

CCLV.

Fear, considered as one of the depressing passions of the mind, has been supposed by Dr. Cullen primarily to affect the cutaneous extreme vessels, in consequence of which the stomach through sympathy is disordered. * But it would be most natural to suppose, from the channel through which such a cause must operate, that the brain and nervous system are primarily affected, and that the heart and arterious system become disturbed, by that necessary and mutual dependence existing between these two systems. The extreme minute parts of both these systems; namely, the sentient extreme nerves and capillary arteries, necessarily accompany each other, and are allowed to be highly irritable. No wonder then, from such connection and irritability, at the disturbance that takes place.

CCLVI.

* See Dr. Cullen's letter to the author (par. CCXXXVI).

CCLVI.

This short account of the pathology of fever I shall conclude with a paragraph from Dr. Cullen's First Lines, in which the whole of his doctrine is summed up in a general way, and shews the connection of its different parts.

“ The remote causes of fever are certain sedative powers applied to the nervous system, which diminishing the energy of the brain, thereby produce a debility in the whole of the functions, and particularly in the action of the extreme vessels; such, however, is, at the same time, the nature of the animal œconomy, that this debility proves an indirect stimulus to the sanguiferous system; whence, by the intervention of the cold stage, and spasm connected with it, the action of the heart and larger arteries is increased, and continues so till it has had the effect of restoring the energy of the brain, of extending this energy to the extreme vessels, of restoring therefore their action, and thereby especially overcoming

coming the spasm affecting them; upon the removal of which, the excretion of sweat, and other marks of the relaxation of vessels take place."

This summary of the doctrine may be considered, as an account of the rise and progress of a febrile paroxysm, the whole phenomena of which evidently depend, according to Dr. Cullen's view of the subject, upon debility, spasm, and re-action. I next shall proceed to the physiology of the stomach, on which I propose to be very brief.

C H A P. II.

Of the various affections of the Stomach.

S E C T. I.

Of the Physiology of the Stomach.

CCLVII.

THE stomach may be considered as the distinguishing *characteristic* between the animal and vegetable kingdoms. The function of it in the conversion of our aliment is certainly involved in much difficulty and darkness, notwithstanding the many ingenious experiments that have of late been made, with the view of throwing light upon the subject. It was subjected to many various opinions among the ancients; I shall say little more than, in a few words, is necessary to give my own opinion on it, as far as the structure of the parts assists me, and the

the analogy of other operations in the system corresponds.

CCLVIII.

The stomach is a muscular bag, the internal surface of which is lined with a very villous and vascular membrane, and furnished *also* with numerous small glands. Many very different hypotheses have been offered to explain its action, which being so well known, it would be idle fully to enumerate; and I shall therefore only observe that, “*Some* have compared it to a mill, others to a stewing pot, others to a wort-trough, when all the while it must have appeared, that it was neither a mill, nor a stewing pot, nor a wort-trough, nor any thing else, but a stomach *.”

CCLIX.

The change produced on our aliment, in all probability, depends upon the secretion of a menstruum peculiar to the stomach,

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and

* Dr. Hunter in his Introductory Lecture.

and endowed with properties suited to that end. Many experiments prove the presence of such gastric liquor, the existence of which, I imagine, most likely to depend on a due tone and action in the vascular structure of the stomach. In what particular way the menstruum acts upon the solid aliment, experiments have not yet quite so satisfactorily shewn, as is to be wished; it is probably assisted by some peculiar action in the stomach itself, for we cannot imitate the solutions performed in the stomach, by the secreted fluids taken out of it.

CCLX.

On the whole, the action of the stomach upon the aliment appears to me principally to depend upon a due state of action in the vascular structure of the villous membrane, which consists both of an exhalent and secretory system of vessels. They may have the effect of loosening the fixed air of the alimentary matters, as by some authors have been said (Cull. Phys. CCXXXVI.) and thus prepare them for the putrefactive and
 acescent

acescent fermentation ; but of this, and other opinions, it is not necessary to speak.

CCLXI.

The remarks thus far made, I consider, as pointing out the primary end and function of the stomach, as life could not long exist without its mansion being daily repaired by fresh supplies : but its relative and secondary use is the influence it exerts over the system at large. It is *the seat of sympathy ; the throne of sensibility*, to which all the other functions of the system look up ; its long acknowledged influence is attested by the records and opinion of the ancients.

CCLXII.

The stomach had been by them observed so frequently to be affected by sympathy with many other parts of the body, even with the brain, that they even went so far as to fix the seat of the soul in the *cardia*, or upper orifice of the stomach. Their opinion was further confirmed from observing, that a blow on the pit of the stomach would some-

times, even suddenly, prove fatal, and this without doing any apparent injury to the heart or its large vessels, or any of the neighbouring parts. This singular incident seems therefore to argue a very high sensibility in the stomach, and a mutual dependance between it and the vital functions. (LXVIII. LXX.)

CCLXIII.

I hope my reader will be satisfied with these few observations on the stomach and digestion; I shall now immediately proceed to consider the febrile affections of the stomach, to wit, the *anorexia*, *nausea*, and *vomiting*, and I hope to render it probable, that they, as part of the phænomena formerly mentioned, may depend upon the same debility, spasm, and re-action, as the other febrile affections.

CHAP. II. SECT. II.

Of ANOREXIA as a febrile affection of the stomach.

CCLXIV.

The affections of the stomach take place in the order in which I have just now mentioned them, and their violence will depend upon the degree of the aforementioned states of the whole system, I mean, the *debility*, *spasm*, and *re-action*; thus the greater the debility, the stronger will be the spasm, and proportioned to the latter will be the subsequent re-action, and thus to the violence of these general principles in the constitution, the febrile affections of the stomach bear a relative proportion. That this may appear evident, I shall mention the connection of the several affections of the stomach with the general febrile state of the system,

CCLXV.

On the first approach of fever, but particularly when a sense of cold is felt in any

part, the appetite fails, and generally continues, through the whole of the fever, impaired, and even averse to all solid food; (CCXLIV.) while the coldness increases, and the patient becomes affected with tremors, and succussions of all the different parts of the body, the anorexia is changed into, or rather accompanied with, nausea, and if the cold stage be violent, such sickness will end in vomiting, which sometimes, from the violence of the cold stage, will be of a bilious nature. As the vomiting is in general most severe at the height of the cold stage, so it will sometimes continue even at the beginning of the hot stage, (CCXLV,) but when this is completely formed, the sickness and vomiting abate, and will cease altogether on the appearance of sweat. (CCXLVI.)

CCLXVI.

The occurrence of these affections of the stomach, at the very same time that all the other secretions are impeded, namely, the saliva and mucus in the mouth, the urine, sweat,

sweat, and alvine discharge, &c. leads me greatly to suspect that the same cause, which obstructs the action of their respective organs, similarly affects the function of the stomach, impeding thereby its operations, and disturbing the digestive process. It will therefore, in the next place, be proper to consider, whether the cause alledged for the impeded perspiration, and glandular secretions in general, is sufficient to explain any of the morbid affections of the stomach.

CCLXVII.

I shall take it for granted, that a debility of the nervous system lays the foundation of fever (though I have my doubts about it, CCXLVII.) in consequence of which debility the action of the heart, and probably that of the larger arteries, is much weakened, so that a spasmodic constriction takes place on all the extreme vessels, which will very readily account for the suppressed perspiration. But while it is admitted, that such spasm takes place on the skin, it cannot be denied to exist in many other parts of the

body; the extreme vessels terminate on all the surfaces of the body, both externally and internally, and accordingly are numerous throughout the first passages as well as on the exterior surface of the body; in the former, as well as the latter, they may be said to be external with respect to the system at large, and are to be considered as very singularly numerous on the surface of the stomach, on account of its villous structure, where they may be said to be exposed to the action of several external causes.

CCLXVIII.

Every one will allow, that there is sufficient proof of such a system of vessels being present in the stomach, from the frequent instances of large serous secretions, or, more properly speaking, effusions, which are collected there, and often evacuated by vomiting. If therefore there are just grounds for supposing a spasm to be formed on the surface of the body, it is but reasonable to conclude, that the same takes place in the stomach, and even through the whole of the intestinal

testinal tube; and if the former is in the *extreme vessels of the skin*, I may, from analogy, be allowed to suppose, that the latter depends upon a similar affection of *similar vessels in the first passages*.

CCLXIX.

A question here naturally presents itself: Will the action of the stomach upon our aliment be affected by such a morbid state of its vessels? I should certainly think it would, if there are just grounds for supposing digestion in any way to depend upon a due tone and action in its exhalent and secretory system. (See Dr. Cullen's letter to the author, CCXXXVI.) Besides the effusions of serum from the usual terminations of the arterious system, physiologists have agreed, that there is a *succus gastricus proprius*; that a spasm will affect the former, is, I hope, rendered sufficiently probable, from their immediate connection with the circulation; but will the febrile state of the system disturb the secretion of the latter? If we admit the force of analogy, we shall readily allow that it must *be disturbed*.

CCLXX.

CCLXX.

In all other parts of the body secretions are observed to be diminished by the weakness of the sanguiferous system, at the commencement of fever ; so that if the secretion of the *succus gastricus* does in any way depend upon the state of the arterious system, in giving *momentum* to the blood, it must, when this is debilitated, suffer the same injury, which affects the other secretions.

CCLXXI.

If then I have succeeded in my endeavours to make it appear, that appetite depends upon a due tone in the secreting organs of the stomach, and due quantity of the *succus gastricus*, we can, on such principles as the fore-mentioned, readily account for the *anorexia*, which so constantly attends the febrile state of the system.

CCLXXII.

Thus far I have only endeavoured to render it probable, that the primary debility of the system, which must produce an universal constriction

constriction of the extreme vessels, lays the foundation of an atony, with more or less of spasm, in the exhalents of the stomach, and causes at the same time a diminution in the produce of the gastric liquor, on which two I have supposed the condition of the appetite to depend. I shall next proceed to consider *nausea*, the second morbid effect which arises in the stomach, from the febrile condition of the system.

CHAP. II. SECT. III.

Of NAUSEA as a febrile affection of the stomach.

CCLXXIII.

Nausea has been defined by three nosologists, SAUVAGE, LINNÆUS, and VOGEL, “ a vain attempt to discharge by the mouth “ the contents of the stomach,” and is said to be accompanied with flatulence. This last symptom however is far from being constant, and perhaps only attends the chronic affections of the stomach, such as for instance, the *dyspeptic*. I am inclined to consider the
nausea

nausea in fever, as little more than a greater degree of the *anorexia*, arising from an increase of atony in the excretory and secretory vessels on the villous membrane, and combined, probably, with more or less of a spasmodic constriction in them; I do suppose that this constriction proves an irritation to the sentient extremities of the nerves, and causes that uneasy sensation, which gives rise to the action of vomiting, which action, I hope to shew, when I come more fully to consider it, may be justly considered as an effort or exertion of the system to produce a salutary end, namely, that of restoring the morbid condition of the vascular and villous membrane in the stomach to its natural healthful state,

CCLXXIV.

Nausea and vomiting may arise from causes acting immediately on the stomach; thus emetics in general, and acrid *ingesta* operate; but in the case of fever they should be considered as effects secondary, and dependent upon the state of the circulating system.

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They are then produced on the same principles as when they follow *venæsection*. When a person is bled a *deliquium animi* sometimes becomes the consequence, attended with an universal *atony* on the outer surface of the body, which I presume to be the condition of the vessels of the skin from the flowing of the perspirable lymph at that time. A concomitant *nausea* and vomiting take place.

CCLXXV.

It appears to me, that this altered state of the stomach, upon opening a vein, depends greatly upon the depletion of the sanguiferous system, and debility produced in the action of the heart and arteries: the tension in the vessels of the brain before bleeding, being by it removed, produces the *deliquium animi*: the *sudor* and *nausea* are owing to a morbid alteration taking place in the arterious extreme vessels: while the *vomiting* is to be considered as a salutary effort of the stomach, arising from its universal sympathy with the system, to restore the due tone and action of the extreme vessels: the
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good effects of which in such a case I beg leave to explain as follows.

CCLXXVI.

The system, from the loss of blood, has been disturbed by the change of tension in the circulation; the action of vomiting, while it rouses the nervous system, serves to supply the depletion of the sanguiferous system, by forwarding the contents of the *thoracic duct* and lymphatic system, as well as of the venous system, into the arterious system, and thus restoring the tension of the whole: and I cannot help throwing in here a reflection, though I want observation sufficient to authorize me, and I acknowledge it is merely conjectural; it is the following. When we mean by *venæsection* to diminish the volume of the circulating fluids, I think we should avoid, if possible, *nausea* and vomiting subsequent to it, as I much suspect that the latter may have obviated the benefit that was intended, or destroyed that already effected, by the supply it is capable of affording to the circulating system;

system ; and therefore I throw it out as a hint, whether it may not be proper, where we intend to employ both, to order the emetic before the bleeding, unless any considerable *plethora* be present.

CCLXXVII.

So much for nausea, as bringing on the action of vomiting ; I shall now proceed to consider the latter more fully, the end it is capable of answering, and the agents by which such end is produced.

CHAP. II. SECT. IV.

Of VOMITING as a febrile affection of the stomach.

CCLXXVIII.

I have several times observed, that I consider vomiting as a salutary effort of nature, a *vis medicatrix naturæ* : but as this term, though well known in all the schools of physick, has not yet been precisely defined, nor its limits marked out, I shall briefly explain

plain the sense in which I mean to use it; before I go on to apply it to the action of vomiting.

CCLXXIX.

Whatever may be the just definition and limits of that law of the animal œconomy, to which physicians have given the name of *vis medicatrix naturæ*, I am disposed to apply it to every change, or exertion of the system, which seems capable of producing good consequences, by removing a previous morbid state in some one part of the system, provided such consequences are observed to be frequently, although not regularly, the event of such exertion. We have a striking instance of such exertion and its consequences pretty constantly taking place in the case of fever, where an interruption to the action of the extreme vessels, or in other words, a *constriction* of them, is the disease to be overcome; such constriction probably acts as a *stimulus* to the circulating system, in consequence of which its action is increased; this action finally serves to remove the affection
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of the extreme vessels, and restore the healthful balance of the circulation. From hence the *pyrexia* has been considered as a *vis medicatrix naturæ*.

CCLXXX.

I shall now apply this reasoning to the circumstances of vomiting. A cause which produces the forementioned affection of the external extreme vessels, appears to me capable of affecting also the internal extreme vessels at the same time, without supposing any necessary consent of parts to exist. Now because the internal parts are of more importance to the system than the external, and therefore, when morbidly affected, expose to more danger, we may easily conjecture why, in the case of fever, vomiting should be produced. The increased action of the heart and arteries may not alone be sufficient in every case, namely, in such for instance as are attended with a violent cold stage, to remove the affection of the internal parts fast enough; in order therefore to obviate, or guard against such deficiency, *the supreme*
L *Being*

Being seems to have implanted in our constitution an effort to remove this internal affection of extreme vessels by the action of vomiting, which, while it operates immediately in removing such affection, serves also to rouse to action the heart and arterious system.

CCLXXXI.

We see such an effect produced in fever, where the whole of the phænomena evidently evince a general *spasmodic constriction* of the extreme vessels, both on the skin and *primæ viæ*; now unless this be removed, it must prove fatal, but the only power capable perhaps of removing it, is the increased action of the heart and arteries, aided, nay probably began, by the impulse of vomiting. These salutary efforts appear to me evident and necessary consequences flowing from the laws of the animal œconomy, and as such I would call them the *vires medicatrices naturæ*, without going so far as the *Stablians* did, who supposed them the operations of an intelligent agent. (XXXVI.)

CCLXXXII.

CCLXXXII.

But suppose for a while, that such a constriction of vessels does not exist, and that there only takes place an atony in them, let us see if we can reasonably consider the vomiting as capable of removing it. A very celebrated physiologist of the present time has delivered it as his opinion, that the stomach sympathizes with all parts of the body; (LXVIII.) that when an universal debility of the system takes place, vomiting is more or less present, as the consequence of the said sympathy; and that vomiting is as an *index* of a general debility, and often the means of relief to the system, performing in the strict sense of the expression, the office of a *vis medicatrix naturæ*. (CCXLVII.)

Hence I would conclude, that as it rouses the circulation, it must also excite to action the system of capillary vessels, and thereby remove the atony which becomes the foundation of the constriction.

CCLXXXIII.

On the above principle long continued *hæmorrhages* have been supposed to have been stopt by vomiting, which in such cases is frequently observed to occur ; a laxity of the bleeding vessels being considered as a supporting cause of the hæmorrhage : for the action of vomiting, by rousing the circulation, and giving the disposition to contraction in the vessels, serves to put a stop to the effusion of blood. The stoppage of *uterine floodings* may very justly be attributed to such a cause ; and I can affirm from experience, what many have before observed, that vomiting commonly attends these when in excess. If then such a pathological conjecture be well founded, we may also consider the vomiting in fever as capable of obviating the spasm, by removing the previous atony of the vessels.

CCLXXXIV.

The end then which the action of vomiting answers, is that of restoring the health-
ful

ful state of the stomach and alimentary canal, and the proper balance between the internal and external extreme vessels, all which, as performing the office of excretories and secretories, must be similarly affected with the other discerning organs. Sympathy, I contend, bringing about these salutary changes; and may not the want of due sympathy, between the stomach and parts morbidly affected, be a probable cause, why many diseases become lingering, and at last produce *hectic* fever in some, *leucophlegmasia* in others, *hemiplegia* and *paralysis* in others, and the like? But much riper reflection than mine must establish such hypotheses.

CCLXXXV.

The immediate effect of vomiting must be that of expelling from the stomach its contents, which, if suffered to remain in the first passages at the attack of fever, would prove a *febrile fomes*, because they would not undergo the change appointed by nature, by reason of the impeded action of the digestive organs. Hence we see not only the

utility of their expulsion, but of the loathing of food and anorexia which comes on, and which continues more or less till the stomach has recovered its action, by the removal of the impediments to digestion.

CCLXXXVI.

At the time that this is effected, the ventricular mucous glands are emulged, and the spasm of the internal extreme arterious vessels probably overcome, by the particular action of the stomach itself, which some are of opinion is alone sufficient to expel the contents of the stomach.

CCLXXXVII.

Dr. Hunter has publicly delivered it as his opinion, that during vomiting the contents of the stomach are thrown out by the contraction of the stomach itself; and he concludes so because he has found the bladder so contracted as to have expelled the last drop. But I consider vomiting as a more general operation of the system, which gives a stimulus to the remotest parts of
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the circulation, whereby the constriction of extreme vessels externally is also often removed.

CCLXXXVIII.

Nature seems to have been particularly anxious and attentive in guarding us against any permanence of a disordered state of the stomach, by implanting in it such a singular sensibility, that, when affected as in fever, and several other disorders, it seems of itself capable of removing the morbid condition by its own innate powers. In such a light I am inclined to consider vomiting, which is a convulsive action of the stomach, assisted by the exertions of many other muscles.

CCLXXXIX.

Vomiting in fever has been hitherto supposed to depend upon a change of tone, or indeed lost tone, in the muscular fibres of the stomach itself, and considered as a spasmodic affection necessarily taking place upon such previous atony; add to this, that the supposed debility of the stomach, which

produces vomiting, has been conjectured to depend upon an atony of the extreme vessels on the external surface of the body. (See Dr. Cullen's letter to the author, parag. CCXXXVI.)

CCXC.

If we reflect but for a moment, we shall find, that the phænomena of vomiting do not at all correspond with the explanation hitherto given; of the febrile affections of the stomach, not even with the very ingenious conjectures of that celebrated professor at Edinburgh Dr. Cullen; for, when vomiting takes place, not only the muscular fibres of the stomach itself are thrown into a convulsive action, but all the muscles of respiration are spasmodically affected, and more or less every muscular fibre in the body; therefore to make all the phænomena consistent with Dr. Cullen's doctrine, it should have been laid down, that all these parts so acting are in sympathy and consent, and consequently each part, and likewise the

the whole, dependent upon the condition of vessels at the surface of the body,

CCXCI.

That sluggishness of the whole body, and its unwillingness to exert any part of the muscular system at the commencement of fever, seem to me to be indications of the general effort intended to be made by the whole system, and are preludes to the action of vomiting, as if nature, incapable of attending to her *various* functions at one time, withdrew for a while her accustomed influence over the muscular system as from the least important, to fix her watchful eye on the state of the stomach and heart, and finding them disturbed in their functions, sat about removing the cause by rousing the whole muscular fabric to action. (CCXC.)

This reasoning is supported by the *phænomena*, which may be observed on the exhibition of an emetic, of which I shall say more hereafter.

CCXCII.

CCXCII.

Sickness and vomitings are usual attendants on the first months of pregnancy, and are marks of the general irritability of the whole system ; but they in a peculiar manner denote a strong sympathy between the *uterus* and stomach. They are in a general way removed by the act of quickening, yet when violent they have continued, and even caused abortion.

CCXCIII.

Quickening has been attributed to the first motion of the child observed by the mother, but by practitioners it is suspected to be brought about by the sudden emersion of the *uterus* from the *pelvis* into the *abdomen*. Why the affections of the stomach should then cease altogether, or even abate, it is difficult to explain.

CCXCIV.

Great debility, general and partial spasms, thirst, anasarcaous affections, &c. have occurred
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in cases of violent vomitings, of which instances are related in the III^d Volume of the Medical Observations and Enquiries published at *London*, 1767. But be the cause whatever it may, that disturbs the stomach, such states of it denote its universal influence over the whole system.

CCXCV.

To conclude my remarks on vomiting, I beg leave to observe, that the opinion thrown out in CCXC, respecting the muscular system at large, and the general and *united sympathy* of all its parts during vomiting, not having been advanced either by Dr. Cullen, or any body else, as far as I know, I therefore do presume to aver, that the whole may be justly considered as a general effort of the system to remove the *spasm* and *constriction*, that must necessarily affect the vessels of the stomach, as well as those on the exterior surface of the body.

CCXCVI.

CCXCVI.

I am now naturally led to consider a little fully, that singular *apparent* sympathy and consent, which have been supposed to take place between the stomach and skin on many occasions.

CHAP.

C H A P. III.

On the Sympathy and Consent between the stomach and skin in fever.

S E C T. I.

How the SYMPATHY and consent depends, upon the balance and connection of the extreme vessels, and not upon the condition of the muscular fibres of the stomach.

CCXCVII.

BEFORE I proceed, I think it proper to observe, that these terms, *sympathy and consent*, in the sense here used, seem liable to some objections and restrictions, which I shall particularly point out by and by, and then propose others in their stead, which seem to me more proper. At present I shall use the old language, that I may not be misunderstood.

CCXCVIII.

CCXCVIII.

This sympathy is particularly evident in the case of fever, where it is observed, that the impeded function of the stomach is seemingly dependent upon the *state* or *morbid condition* of the skin; but there are likewise other occasions on which we find that the active powers of the stomach seem to be proportioned to a certain degree of tone and energy in the action of the extreme vessels terminating at the skin. How this is I shall now attempt to explain.

CCXCIX.

The pathological explanation of the sympathy in question, which first particularly claims my attention, is the one advanced by Dr. Cullen in his First Lines on the Practice of Physic, and is as follows. He has supposed, that the affections of the stomach corresponded to the atony and spasm of the extreme vessels on the outer surface of the body, by a corresponding atony and spasm in the muscular fibres of the stomach itself, arising from sympathy and consent. In the
first

first place then, let me consider a little, if these muscular fibres of the stomach can be admitted to be in an atonic state.

CCC.

I have already observed, that at the time of vomiting, not only the stomach, but all the muscles of respiration are likewise spasmodically affected; (CCXC.) this phenomenon alone, which shews the strong exertion of the whole system, evinces to me, that there is rather an increased tone and action in the muscular system at that time; or at least it must be allowed that there is a general sympathy between all the muscles which act in the time of vomiting, and the skin; and though there seems to be a general debility in the body, it may arise from an affection of the sensorium, in consequence of the debile state of the vital organs; and this view of the general debility will be further rendered plausible, by what I am hereafter to observe with respect to the effects of vomits.

CCCI.

When I consider the anatomy of the stomach, together with that of the skin, I cannot help representing it to myself as improbable, that any such sympathy and consent should exist between parts so evidently different in their structure and proportion, namely, between invisible vessels (for they may be said to be such) and muscular fibres of considerable size; add to this, what I have already observed, that the *phænomena* of vomiting do not at all agree with such supposition, as vomiting does not so much depend upon the action of the stomach, as upon the exertion of the whole system, as is evident from the state of respiration, voluntary motion, &c. during vomiting. (CCLXXXII. CCXC.) Having thus stated my objections to the old doctrine, I shall proceed to establish a new one.

CCCII.

It is the same consideration I made above, viz. that of the anatomical structure, which
leads

leads me to think, that the *apparent* sympathy may be explained on another principle, which will be supported and made probable, by the *phænomena* being consonant to one another. I have already supposed a necessary affection of internal vessels, from the same cause which produces the affection of the external ones; and therefore I need go no farther, in order to explain the occurrence of symptoms at the same point of time, than to suppose, that the sympathy and consent takes place between vessels and vessels, and these too probably in every respect similar, rather than between vessels and the muscular fibres of a large organ.

CCCIII.

This explanation is strictly consistent with the general doctrine of fever delivered by Dr. Cullen, at the same time that it agrees better with the general laws of the animal œconomy; I am therefore inclined to refer the correspondence of the atony of the stomach with that of the outer surface of the body to the correspondence of the state of

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the minute vessels on its surface with the state of the minute vessels terminating at the skin, from which relation there arises a mutual and proportionate spasm, if the debility is considerable enough to produce it.

CCCIV.

On this supposition I am led to consider the inordinate action of the stomach which excites or rather produces vomiting, in conjunction with other muscular parts similarly affected, as not proceeding from an atony in the muscular fibres of the stomach, but as solely depending on the operations of the *vis medicatrix naturæ*, exerted to overcome the spasm and obstruction in, and increase the action of, its superficial and secretory vessels, for the same purpose, that the action of the heart and arterious system is increased, in order to remove the spasm at the surface of the skin, namely, the spasm of the extreme vessels there terminating.

CHAP. III. SECT. II.

How the balance and connection of the extreme vessels, giving the consent between the stomach and skin, may be illustrated by the operation of medicines, as well as by the general phænomena of fever.

CCCV.

I shall now attempt some further proof and illustration of the foregoing doctrine; and that I may not conceal any thing from my reader, let me offer one observation to his candour, which, I hope, tends rather to support than destroy the *hypothesis* I have advanced. It is this, that though I am contending for an affection of vessels only, yet it ought to be considered that these vessels must every where be supposed furnished with muscular fibres, and that therefore if a sympathy could possibly exist between muscular fibres alone (see Dr. Cullen's letter to the author CCXXXVI.) in distant parts of the body, it would seem more likely to take place between those fibres belonging to

parts similar, rather than to parts dissimilar, i. e. rather between muscular fibres of internal vessels and external vessels, than between those of the stomach itself, and those of vessels at a distant part of the body, to wit, at the skin.

CCCVI.

To proceed however with the further proof of my doctrine, I think, in the first place, it may be observed, that the affections of the stomach take place more or less, according to the degree and extent of the atony present, or of the spasm formed in consequence of the atony, which furnishes a presumptive proof, that the disordered state of the stomach depends upon this vascular connection, and condition of the cutaneous vessels; for to what can we so readily attribute the morbid state of the stomach, as to an affection of its vascular structure, when we see it so constantly take place at the time, that the other phænomena of fever evidently evince a general affection of the exhalent and secretory systems, and when it seems so particularly proportionate to the
extent

extent of the morbid state of the vessels at the surface of the body. (CCCII. CCCIII.)

CCCVII.

Secondly, The sudden operation of emetics, as well as the peculiar effects of nauseating doses, seem further to support this affection of vessels. Their operations have been hitherto explained by pathologists, even by Dr. Cullen, on the principle of their affecting the muscular fibres of the stomach. But I cannot see how an external stimulus can be particularly applied to the muscular fibres alone, without first affecting those more irritable parts of the villous membrane, to which they are immediately applied.

CCCVIII.

When the emetic matter is of a sedative nature, it may operate on the *sentient extremities* of the nerves in the stomach, and by sympathy weaken the general circulation, and thus form a spasm on the extreme arterious vessels every where, which probably would be too permanent, if not

quickly removed by the exciting efforts of the *vis medicatrix* in producing vomiting, to expel the noxious emetic matter, and prevent further mischief.

CCCIX.

Effects nearly similar take place when the emetic matter is stimulant, but not with such signs of general debility. The emetic cannot then be supposed to produce vomiting by causing an atony in the muscular fibres. In either case therefore it appears to be the operation of the *vis medicatrix*, which throws out what is disturbing the stomach in its vascular structure, and might prove hurtful to the constitution.

CCCX.

The *dyspeptic* state of the stomach (or in other words, want of appetite and sickness) has been supposed to depend upon a loss of tone in its *muscular* fibres. If it be so, it may be looked upon as an argument against the supposed sympathy between *these* fibres and the vessels on the skin, unless we are not to suppose the sympathy mutual. If it

is mutual, then, in dyspeptic states of the stomach, the vessels of the skin should be morbidly affected. But this is not the case, and probably the reason why it is not, is, that this is a chronic, and therefore partial affection, and otherwise brought about.

CCCXI.

The healthful state of the stomach, as I have before observed, seems to me entirely to depend upon a due tone and action in the exhalent and secretory vessels of the villous membrane; and I am inclined to consider the muscular structure of the stomach itself, as wholly intended to keep *its contents* in proper contact every where with the villous membrane, that *they* may be advantageously acted upon by the digestive *menstruum*; and *ingesta*, whether sedative or stimulant, appear to me to act by producing an alteration in the action of the vessels,

CCCXII.

Thus, for instance, common salt is a *stimulus* much in use, and the strongest that

can be applied to the muscular fibres, as experiments have satisfactorily shewn ; so that, if it be allowed that vessels have irritability, (and from the passage taken from the first lines of Dr. Cullen's Physiology it appears that they have a great deal) we must certainly expect that they will be quickly and considerably affected.

CCCXIII.

The passage alluded to is the following ;
 “ It is probable that the muscular fibres of
 “ the arteries become more irritable as the
 “ arteries are more distant from the heart.”
 Institutions of Medicine. 1777. Parag.
 CLIX. page 131—2.

CCCXIV.

Notwithstanding this Dr. Cullen supposes the operation of all stimuli (for instance, of the vitriolic acid) to take place on the muscular fibres of the stomach ; but when I consider how well these are defended from *such action* by the thickness of the villous membrane, I cannot readily admit the explanation, and must suspect that all stimuli
 so

so applied will first, at least, affect the extreme vessels on the surface of the stomach, and produce a change of action in them.

CCCXV.

Besides, the rules given for the administration of medicines in general are contrary to such a supposed operation. Medicines have been supposed to act best on a fasting stomach, and accordingly in general have been advised to be given during such a state of it. Why? (my answer would be) Because in that state they are both less diluted, and act more immediately upon the villous membrane. Such exhibition then must be directly contrary to their supposed operation on the muscular fibres, because, the stomach being empty, these are very considerably defended by the puckering together of the villous membrane, from the contracted state of the stomach.

CCCXVI.

From this I am led to observe, that if it is wished that a medicine should operate on
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the muscular fibres (if such action can be of any service) it should be given in the distended state of the stomach, when the villous membrane is greatly expanded; but even in that state of the stomach, if it can affect the muscular fibres, it must also materially affect the villous vascular membrane.

CCCXVII.

I shall endeavour to explain my opinion respecting the operation of medicines in general, by some observations on the Peruvian bark, &c. The Peruvian bark has not generally been supposed, I believe, to enter the circulating system, but to produce its effects by acting on the *primæ viæ*, by which we can account for its sudden effects in intermittents. Such operation is consistent with the opinion which has been advanced of the sympathy of the stomach with all parts of the body. But does it act on the parietal muscular fibres of the *primæ viæ*? In my opinion it does not; because to do that it must have entered the absorbent system to be in contact with them, as the villous

villous internal membrane is the part to which it is immediately applied. Here it might be alledged, that it affects them by sympathy, from acting on the sentient extremities of the nerves.. I do not doubt but that these nerves may be affected, still I cannot see how the extreme vessels can escape being acted upon, they having been proved, from experiment, to be very irritable.

CCCXVIII.

All medicines seem to me necessarily to produce their action, first on the villous membrane, after the manner in which cathartics operate ; these are *stimuli*, which from their irritation on the exhalent vessels, and excretory ducts of small glands, cause an increased effusion from the former, and secretion in the latter, from which two circumstances arise the liquid stools. If such then be the operation of cathartics, it is to be presumed, that medicines in general act upon these and similar parts, through the whole

whole of the first passages, each producing its effects, according to its nature, on this or that particular part.

CCCXIX.

Thus, the bark, for instance, acts as a tonic in general (from the connection and consent between the extreme vessels of the stomach and all parts of the body); *ipeca-*
coanha as a vomit; *jalap* as a cathartic, &c. And I greatly suspect that medicines (bark, for instance, when it fails of curing the ague) disappoint us in not producing their effects from the total want, or the diminished influence, of this principle in the constitution. Emetics are capable, I imagine, of calling forth this principle, as after the exhibition of them, we often find medicines succeed, which before had failed.

C H A P. IV.

How the Author's doctrine is illustrated by the same arguments, which Dr. Cullen has made use of to illustrate his own.

S E C T. I.

Remarks on the fact related by Dr. Sydenham concerning the plague.

CCCXX.

IT behoves every man, who means to substitute a new doctrine to an old one, to omit no argument in favour of that which he has newly advanced.

I shall therefore presume to observe, that the vascular connection and consent I wish to establish, to wit, that when there is an atony and constriction of the extreme cutaneous vessels, there exists also in the stomach a similar affection of similar parts, may be further

ther illustrated by the very same arguments, which Dr. Cullen has made use of with the view of illustrating his own doctrine, which is briefly the following. He has supposed, that the atony of the cuticular extreme vessels is the cause of the febrile affections of the stomach, by inducing an atonic state of the muscular fibres of the stomach, from sympathy of parts. Now I do not suppose that sympathy is so immediately concerned in this matter, but that the affection of external and internal extreme vessels chiefly depends (as I may more than once have already observed) on their balance with each other, and their mutual connection with the circulating system.

CCCXXI.

The arguments referred to, which support this connection and mutual affection of vessels, are the following, which are to be found in the XLIII paragraph of Dr. Cullen's *First Lines* on his practice.

I. The fact related by Dr. Sydenham concerning the plague.

II. The

II. The cessation of vomiting at the coming on of the hot stage of fever, and very certainly on any sweat appearing.

III. The effects of vomits in bringing on the hot stage.

IV. The effects of cold water taken into the stomach.

V. The effects of cold applied externally to the body,

I think it quite unnecessary to quote the whole paragraph from the First Lines, as such a valuable work is no doubt in every one's possession. I shall now proceed to consider each of the above arguments at large, in the order they have been mentioned.

Fact concerning the Plague.

CCCXXII.

At the commencement of the pestilential disease known by the name of the plague,
there

there comes on a degree of vomiting so violent, as to hinder any medicines remaining on the stomach, which prevents altogether the relief which the physician in such case might otherwise afford. This excess of vomiting appears to me easily accounted for on the reasoning I have all along made use of. The plague has been considered by the most eminent authors and teachers of medicine, as no other than a *typhus violentissima*, (if you except the occurrence of the *bubo*,) the debility of the system being so considerable, as soon to bring the miserable sufferers to a fatal dissolution. In every *typhus* the debility creates the danger.

CCCXXIII.

In this place I think it proper to observe, that the debility, which appears to me to prove fatal in such cases, properly belongs to the various functions of the system, on which life more materially depends; nor am I inclined to consider the concomitant debility of the muscular system, as in the least dangerous independent of the various
affections

affections of other more important parts. Indeed I am more inclined to consider the muscular system soon after the approach of fever, as rather acquiring an increased tone, and energy of exertion, in order to obviate the dangerous consequence of a debility in the vital functions, which is rendered so highly probable from the common occurrence of vomiting at that period.

CCCXXIV.

After this view of the *apparent debility of the muscular system*, it appears to me difficult to explain that occurrence of affections in the stomach, and on the skin at the same time, from any supposed sympathy between the muscular fibres of the former, and vessels in the latter. For we might reasonably have expected, that, if there had really existed a sympathy between these parts, such violent exertions of the stomach and system in general, at the time of vomiting, would have been accompanied with a correspondent increase of action in the vessels on the surface

of the body, which form the capillary system.

CCCXXV.

This sympathy therefore, from the action of vomiting, must necessarily have ended in removing the atony and constriction of vessels on the cutaneous surface, *the supposed principal and supporting cause of fever*. In every view of the subject, the exertions of the system during vomiting seem to me to argue an increased tone or tonic power of the stomach, (for it is difficult to suppose that an atony could exist in the muscular fibres of the stomach at that time,) which, if Dr. Cullen's alledged sympathy had existed, must have produced a correspondent tone and exertion in the extreme cutaneous vessels.

CCCXXVI.

Since vomiting is not an exertion of the stomach alone, but of the system at large, the more I reflect on its phænomena, the more reason I have to believe, that it is a principle of the animal œconomy, implanted
in

in it by the *supreme Being*, to restore the action of the stomach, when impeded by the febrile state of the system (CCLXXX.). Can its violence therefore at the commencement of the plague be accounted for on this principle?

CCCXXVII.

I shall take it for granted, that the greater the debility in the function of the system, the greater are the exertions of nature to restore them to their healthful state; therefore, as the debility in the plague is greater, *cæteris paribus*, than in any other febrile affection, the vomiting is of consequence more violent; and yet not always sufficient to answer the intentions of the *vis medicatrix*: and I cannot help considering the vomiting as hurtful in the end, when it is not in due time followed by a relaxation of vessels, because it may wastefully expend the vigor of the system, and increase the debility of the functions (CV. CVI. CVII.).

CCCXXVIII.

Dr. Sydenham found the vomiting so considerable in the plague as not to admit any medicine to stay upon the stomach ; he had therefore recourse to external applications, with the view of relaxing the spasm on the surface of the body, and for this purpose made use of the hot bath : as soon as the sweat broke out the vomiting abated, and soon entirely ceased. This *phænomenon* has been supposed by Dr. Cullen to be brought about by restoring the tone of the muscular fibres of the stomach, and removing the spasm affecting them ; but I think, notwithstanding this great authority, that its operation may be explained on my own *hypothesis* of a supposed mutual affection of vessels.

CCCXXIX.

The hot bath proves a general *stimulus* to the system, and of course increases the action of the heart and arteries : this must finally restore the action of the extreme vessels every where, and remove the interruption in the function of the secretory organs ;

organs; but the water will further tend greatly to relax the constriction of the cutaneous vessels. While then the sweat flows on the surface of the body, the exhalent and secretory organs in the stomach, as well as in other parts of the body, recover their action; and this restoration having been the chief object of vomiting, as an effort of the vis medicatrix, it then ceases, there being no longer any need of its continuance.

CCCXXX.

That this is the case in the plague is well known. The fact has been taken notice of by several other writers on the subject, who have all agreed in the observation, that on the breaking out of a sweat the vomiting has ceased. An obstinacy in vomiting might no doubt take place at the violent attack of any other fever; and I should not hesitate to have recourse to the use of the hot bath, at the commencement of most fevers, if it was attainable, as I think it more efficacious than a vomit, from its being so immedia-

ately an universal stimulus to the circulation, *on the principle of sympathy between the extreme vessels and the HEART* (CXXIV.).

CCCXXXI.

I cannot quit this part of the subject, without offering a few reflections on the *variolous* attack. Great *nausea* and vomiting will sometimes, nay do often, occur during the eruptive fever of the *small pox*, especially if there be any crudities and corrupted humours in the stomach and *primæ viæ*. In this disorder the greater or lesser quantity of the eruption is probably owing to the state of the extreme vessels, at the time of the eruptive fever; and the previous state of the stomach has, in general, been observed to bear a relative proportion to the quantity of the eruption that afterwards does appear.

CCCXXXII.

If then, from the universality and permanency of the constriction of the extreme vessels, the greater quantity of the eruption takes place, and has already been preceded
by

by the above-mentioned affections of the stomach, from there having probably been a similar eruption forming on the villous membrane from a similar cause, may we not reasonably expect, that by obviating the constriction of vessels, we shall have less fever, and afterwards fewer *pustules*.

CCCXXXIII.

In this way, I should imagine, nauseating doses may operate advantageously at the commencement, and during the period, of the eruptive fever: and vomiting, from whatever cause produced, whether by nature or art, may be considered as a means used to throw off, by the perspiratory organs, and extreme vessels in general, the variolous matter which forms the pustules, by timely overcoming, if not preventing, the constriction of vessels, that would retain it in the skin, and capillary system.

C H A P. IV. S E C T. II.

On the cessation of vomiting at the coming on of the hot stage of fevers, and very certainly on any sweat appearing.

CCCXXXIV.

I shall next consider the cessation of vomiting, which takes place commonly at the coming on of the hot stage of fever, but very certainly on any sweat breaking out. Dr. Cullen, when speaking of this phænomenon, makes the following observation: “ It is indeed probable, that the
 “ vomiting in the cold stage of fevers, is
 “ one of the means employed by nature,
 “ for restoring the determination to the
 “ surface of the body.” First Lines, paragr. XLIII.

CCCXXXV.

The explanation of this will appear evident from what I have already said. If a debility of the nervous system should lay the foundation of a weaker action in the heart
 and

and arterious system, the *momentum* of the blood, which depends on the action of the heart chiefly for its velocity, must also be diminished, which diminution again will be chiefly felt in the system of the extreme vessels, or *capillary* system; hence, from wanting the distensile power, by which the tone of these small vessels is supported, they will naturally contract, or be constricted.

CCCXXXVI.

I have no doubt but that, in long continued fevers, where the constriction has been permanent, the sides of these small vessels may have coalesced together, and become imperviable to the *momentum* of the serosity ever after, so that if the fever proves not fatal, there must be an increased determination of serosity to some other discerning organ, that life may be supported; for I imagine it cannot long continue (or, if it does, it must be in an unhealthful state) without more or less of the insensible perspiration continuing, or (as an equivalent to
the

the loss of it) without an increased secretion in some other organ, or effusion internally from other serous arteries.

CCCXXXVII.

To such a permanent constriction may be owing the *diabetes*, *obstinate diarrhœas*, *anasarca*, *incysted dropsies*, &c. which have been observed sometimes to come on after long continued fever; and such permanent constriction of the extreme vessels on the surface of the body, particularly on the extremities, is more likely to continue than in the internal parts, as they are more distant from the heart, and are at the same time exposed to many external causes that may support the constriction, and counteract the good effects of the increased momentum of the blood, from the increased action of the heart and arteries (CCCXXXV.).

CCCXXXVIII.

It is on this principle likewise, that I would account for the partial sweats that sometimes
occur

occur on the head and breast, while a constriction exists on other parts of the surface. I likewise think it probable, that the *pluritic*, *arthritic*, and *other* affections, which sometimes follow *intermittent fevers*, may be owing to the continuance of the atony and spasm in the internal extreme vessels of the parts so affected. Upon the whole I think it sufficiently probable, that a mutual exertion and balance in the extreme vessels is essentially necessary to perfect health, and that many *topical* diseases of the system may be owing to a total abolition of their function *in other parts*, though not made known to the physician by any *apparent* change *in those parts*, where the function of the extreme vessels may have been lost.

CCCXXXIX.

I shall conclude the consideration of the present argument with observing, that as the action of vomiting, at the accession of fever, keeps a corresponding proportion with the state of the vessels on the outer surface of
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of the body, i. e. that as its *commencement*, *continuance*, *violence*, and *cessation*, are regulated by the state of action in the cutaneous extreme vessels, it strongly argues a dependence on a similar affection of similar vessels at the stomach. (CCLXIV.) The secretory minute parts in the stomach are no doubt similarly affected with the other secreting organs, from the cessation of the febrile affections of the stomach, when the other secretions are returning to their natural state, whether immediately affected by the action of vomiting, or the augmented force of the circulation. The appetite is necessarily restored in due time, because the digestive organs will have then recovered their wonted vigor and free action (CCLXV.).

CHAP. IV. SECT. III.

On the effects of vomits in bringing on the hot stage of fever.

CCCXL.

I am now to consider the effects of vomits in bringing on the hot stage. Agreeable to the opinion I have all along advanced respecting vomiting, I am inclined to explain the operation of emetics in the following manner; I do suppose, that, from some *specific* noxious quality which they possess, they in some way disturb the action of the extreme vessels, and probably also the secreting organs of the *succus gastricus*, (at the same time may irritate the sentient extremities of the nerves) from which operation the sensibility of the stomach, feeling an enemy harassing its territories, or interrupting its function, is roused, and then calls to her aid the superior exertions of vomiting, as a law of the *vis medicatrix*, which happily terminate in the expulsion of the offending matter.

matter. This may be considered as a primary effect (CCCVII. CCCVIII. CCCIX.).

CCCXLI.

As a secondary one I would say, that the shock, which the whole system receives by the action of vomiting, must be attended with a temporary increase of the circulation; that therefore, by giving an emetic before the cold stage of an *intermittent* comes on, we often altogether obviate it, and perhaps the succeeding stages, by having roused the nervous system, and put into brisk action the vital organs, so as not to allow that debility in the circulation to take place, which has been supposed to lay the foundation of the cold stage, and all the subsequent symptoms. If the emetic be exhibited later, namely, when the cold stage has already commenced, we still may shorten the cold stage, by hastening the accession of the hot:

CCCXLII.

It is somewhat singular, that on the exhibition of a vomit, and as preparatorily to its
 acting

acting as such, the system in general should undergo a change, in several particulars, very much resembling the accession of fever. These particulars, as they have been generally unattended to, I shall describe; they are the following: Soon after taking an emetic, or rather, I should say, *some time before it operates*, an evident languor and inactivity come on, accompanied with *palleness* of the face, and a *weaker, smaller*, and rather *quicker pulse* than natural; the sick man will *totter*, and *be giddy*, as from inebriation, on walking about the room: a *moisture* may be often observed *on the skin*, particularly *on the face*, and an increase in the salivary secretions, indicating the *relaxation of excretories*: I myself lately experienced, on taking an emetic, *some* of the above, together with *aching pains* in my hands, arms, and legs, and a *sense of coldness*, particularly on walking about the room. Soon after these symptoms have come on, the *nausea* increases, and shortly ends in *vomiting*, which restores the system to its pristine state.

CCCXLIII.

The *temporary debility* of the voluntary motions, and perhaps the *weakness of the circulation*, both seem owing to the inattention of nature at that particular time to those functions, the whole of her attention being taken up in obviating the retention of the emetic matter, and effectuating its expulsion by the exertion of vomiting. One would be almost led to suspect, on *attentively* considering the operation of an emetic, that *the remote cause of fever may often act principally on the stomach*, and bring on the symptoms of the cold stage in the same manner, that the emetic matter produces the general languor, and the debility of the circulation, previous to vomiting (CCXLVII. CCLII.) Probably the *cause of fever* is more difficultly got rid of, and hence arises the continuance of it, even though nature has called in the assistance of vomiting.

CCCXLIV.

As the operation of emetics 'seems occasionally to vary, as they are of a *stimulant*
or

or *sedative* nature, I shall make some observations on the peculiarities, that may be supposed to belong to each.

CCCXLV.

If they are of the *first kind*, their effects may depend upon their irritating the sentient extremities of the nerves, as well as the extreme vessels, and other minute parts in the villous membrane, which, from causing an uneasy sensation, gives rise to the convulsive action of the stomach; the irritating matter is then expelled, and the organ restored to its natural state. The operation of such emetics is commonly attended with an increase in the secretions of, and effusions into, the stomach, as is evident from the great quantity discharged by vomiting: there will also be an evident glow of heat on the skin, and an increase of perspiration, which seems a strong proof of the particular connection between the external and internal extreme vessels; notwithstanding which the stimulant-emetics, *such for instance as the mustard seed powdered*, have even been sup-

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posed

posed to produce an atony in the muscular fibres of the stomach; but this certainly could not happen, as they are of a tonic nature, and suited to remove atony.

CCCXLVI.

With regard to the *sedative* emetics, I think it probable, that when applied to the stomach, they check the nervous influence in the sentient extremities of the nerves; this diminishes the effusions from the extreme vessels, and perhaps the secretion of the *succus gastricus* on account of the cessation in the oscillatory motion of the capillary vessels. This impeded action of the *villous membrane* at length produces *nausea* and rouses the system to exert its timely effort to the removal of the affection. Such emetics are attended with a *palleness of the skin*, *languor*, and *inertia liquidi nervosi*, all of which denote the sedative effects of the emetic matter on the nervous, and sanguiferous systems. Notwithstanding this very apparent diminution of irritability, the muscular system can fully exert itself in the production of

of

of vomiting, in obedience to the *vis medicatrix naturæ*, and thus restore the vigour of the whole.

CCCXLVII.

In order further to illustrate the effects of an emetic, I shall beg leave to make use of a *simile* borrowed from the animal œconomy, and which is one, among many other instances that might be mentioned, of the wise operations of nature, who, while she established laws for the preservation of the whole system, under the guidance of the *vis insita sympathiæ*, did not neglect to screen from injury particular parts of it.

CCCXLVIII.

It was necessary to distinct *vision*, that the anterior surface of the eye, particularly the *cornea*, should be kept bright, and every, the most minute, extraneous body prevented from lodging on it. Nature has accordingly made provision for this purpose, by an appendage to the eye, the *glandula lachrymalis*, the source of the tears. It is situated within

the orbit above the *outer canthos*; and its ducts open near the angle formed by the two eye-lids near to their *inner edge*. The tears are carried across the eye to the *inner canthos*, and pass out to the *saccus lachrymalis*, to be from thence conveyed to the nose. Thus they wash every, the most minute, particle from before the sight. Let us see then the effect of a mote falling into the eye.

CCCXLIX.

The *tunica conjunctiva*, a reflected membrane covering the anterior surface of the eye-ball, and the internal surface of the eye-lids, is highly sensible, particularly that part of it which lies on the eye-lids, and sympathizes with the lachrymal gland. The mote falling on the eye is generally drawn within the upper eye-lid, and gives considerable irritation. The consequence of this is, that a very sudden increase in the secretion of the tears takes place, and will, if the mote is not too large, effectually wash it from the eye, or hurry it to the *saccus lachrymalis*. If the offending matter should perchance be
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an acrid fluid, as vinegar, the flow of tears, by diluting it, destroys its power of further irritating the eye. Such has been the wise providence of nature, in preserving that most useful and important of all our organs.

CCCL.

Let us make the application to our subject. The villous membrane of the stomach is irritated in its way by the emetic matter, as the tunica conjunctiva was by the mote, and if it were not expelled might probably suffer some injury from it. Nature, attentive to this, raises a nausea, relaxes the excretories of the stomach, increases thereby the quantity of the gastric fluids, weakens thus the power of the medicine, and then, to prevent further bad effects, expels nearly the whole by vomiting.

CHAP. IV. SECT. IV.

On the effects of cold water taken into the stomach,

CCCLI.

The next proofs of my doctrine relate to the effects of cold on the human body; and first, I am to consider the effects of cold water taken into the stomach.

The circumstances already mentioned seem me to be sufficient evidence of a connection between the stomach and the skin: still the present argument, and the one next to be considered, are further proofs of such a connection.

CCCLII.

After all that has been said, I am ready to allow it a very difficult task to arrange the facts, and give them their proper application, so as clearly to shew to others, why such a connection between the external and internal parts should exist, and still a more difficult

difficult one to say, in what system of minute invisible parts it particularly consists.

It has been, notwithstanding, from frequent observation allowed to take place, and I will venture to offer it as my opinion, that it is to be referred to the *capillary system of vessels*, (CXCIX.) and may, as I suspect, be owing to a law of nature, a VIS INSITA SYMPATHIÆ, that when one extremity of the circulating system (considering the external and internal capillary vessels as the extremes of the said system) is morbidly affected, the other should consent, that the whole system may be roused, and the vis medicatrix naturæ exert her seasonable endeavours to remove the affection. In making this reflection I have given great latitude to the influence of sympathy and consent.

CCCLIII.

Though cold water taken into the stomach may produce hurtful consequences in some states of the system, it would be foreign to our present pursuit to consider them

now. What I mean at present, is to offer a few remarks on its salutary effects, as these will most strikingly prove the connection in view. (CCCLII.)

CCCLIV.

It has been the practice with some physicians to give a draught of cold water in fever, in order to procure a sweat; and the practice has been attended with success. It had been observed by them, that a cold draught taken in warm weather soon after excited a glow over the body: they took advantage of this phænomenon, and made use of it in the cure of fever. I cannot conceive the effects produced in such a case to depend upon any other operation, than that of the cold applied to the vessels and nerves of the stomach, and, from a change produced in the tone and action of these, affecting, *by balance of sympathy and consent*, the extreme vessels on the surface of the body.

CCCLV.

As cold moderately applied, when the system is in full vigor, acts by a tonic and
stimulant

stimulant power, it can be readily supposed, in the present case, that it produces an increased action in the vascular structure of the stomach, and (from an *established consent*,) that similar effects take place on the surface of the skin. It must be allowed a weighty argument, in support of the *favorite doctrine of sympathy and consent*, as I do not see that we can comprehend, how pure water alone can act by entering the circulation, and being determined to the skin : the quantity of the water used, and the suddenness of its effects, are far from being agreeable to such a supposed *modus operandi*.

CHAP. IV. SECT. V.

On the effects of cold applied externally to the body.

CCCLVI.

Lastly, I have to consider the effects of cold applied externally to the body. These likewise

likewise very clearly shew the dependence of the condition of the stomach on that of the skin, from the changes produced in it by cold applied to the skin. Frequent instances occur of the invigorating effects of cold on the human body, when it does not stop the exhalation of the perspirable matter; it proves then a very potent mean of increasing the appetite. We have a remarkable instance of this in its effect on the appetite of those persons, who, *during frost*, exercise themselves in skating: they will at that time perspire most freely, and have a most voracious appetite; but both these symptoms, it has been observed, abate, or altogether go off, when the stimulating effects of the cold on their bodies have ceased.

CCCLVII.

Again, when sedative and astringent effects, and a retention of the perspirable matter,

matter, proceed from cold applied externally, it commonly diminishes the appetite ; which is a further proof of the balance and connection of the parts concerned.

CHAP.

C H A P. V.

Some opinions are delivered in a concise point of view, as a summary to the whole.

S E C T. I.

Some general conclusions respecting the febrile affections of the stomach, by way of COROLLARIES.

CCCLVIII.

IHAVE finished, in the preceding chapter, with my arguments in illustration of the doctrine I have ventured to take up. I am apprehensive of having been too tedious and prolix in some parts, most probably not altogether clear in others, and of having unavoidably fallen, from the nature of the work, into the too frequent repetition of the same ideas. I hope however that my reasoning has not wanted facts to support it, and
that

that the difficulty of the subject will be an apology for its deficiencies.

CCCLIX.

I shall now lay before my reader some general conclusions, by way of *corollaries*, and finish with a summary of the pathology of fever, and the *promised observations* on the terms sympathy and consent. (CCXCVII.)

C O R O L L A R I E S.

CCCLX.

COR. I. If a debility of the nervous system, from whatever cause induced, ceases a weakened action of the heart and arteries, this must necessarily and principally be felt in the terminations of the arterious system, namely, the systems of capillary arteries, and secretory vessels; I therefore consider the ANOREXIA, which so generally attends the beginning of fever, as depending on an ATONY of the extreme vessels, and a diminished action of the villous glands of the stomach.

CCCLXI.

CCCLXI.

COR. II. If it can be reasonably supposed, that the continuance and increase of the general debility are attended with a proportionate atony of the extreme vessels, and that the spasm of the extreme vessels is more or less according to the extent of the atony in them, then I conclude, that the NAUSEA depends upon the CONSTRICTION formed, in consequence of the increase of atony in the vessels of the stomach.

CCCLXII.

COR. III. If the continuance and increase of the general constriction of vessels, together with the total cessation of the function of the stomach, can be justly considered as a sufficient cause to rouse the *vis medicatrix sympathiæ* to her salutary exertions, then I should consider the VOMITING as the RE-ACTION of the stomach and muscular system, completely suited, in most cases, to restore to its due action, that important organ of digestion.

CCCLXIII.

CCCLXIII.

COR. IV. and last. If debility, spasm, and re-action can satisfactorily explain the morbid changes which occur in the circulating system, and secretions in general, *atony, constriction, and re-action*, as above, will equally explain the morbid changes or affections of the stomach, to wit, the *anorexia, nausea, and vomitio*.

CHAP. V. SECT. II.

The author attempts to give a new summary of the pathology of fever.

CCCLXIV.

I shall now attempt to give briefly at one view the doctrine and extent of the vis medicatrix in fever, as a summary of that part of the treatise in particular, which relates to the subject of fever, agreeable to the pathology I have all along adopted. I say then, that the remote causes of fever act with a sedative effect, and induce a debility of the
nervous

nervous system, whereby the vital function of the heart and arteries is considerably and particularly affected:—that this debility in the circulation will most readily be felt at the extreme vessels, which terminate at every part of the body, but particularly in those at the skin and *primæ viæ*, from established connection and mutual balance;—that a constriction will then be formed, and an obstruction take place in the secretions in general, in the exhalation of the perspirable matter, and effusion of the gastric and intestinal liquors;—that this constriction not only proves a general stimulus to the circulation, in consequence of a sympathy between the heart and vessels, but a particular one to the stomach itself, as the first of the secreting organs; —and that this stimulus, at the same time that it increases the action of the heart and arteries, excites the stomach to vomiting, both which effects are to be considered as the efforts of the *vis medicatrix naturæ*, for the salutary purpose of restoring the condition of the extreme vessels, and secretory organs in general, to their natural and healthful

ful state, which being fully accomplished the *pyrexia* and vomiting abate. These operations are supposed to be brought about, upon the principle of a *VIS INSITA SYMPATHIÆ* (CCCLII.).

The reader is desired to compare the above summary of fever with the one drawn up by Dr. Cullen, agreeable to his own system. It has been mentioned (parag. CCLVI.) in this treatise, as a quotation from his First Lines.

CCCLXV.

I would have the above summary considered as the regular train of symptoms in the progress of an intermittent paroxysm; when there are wanting the complete solution, and perfect intermission, this constitutes the continued and remittent fevers, which I think may be explained by saying, that while the quickness of the pulse, and loss of appetite continue, they argue either an imperfect solution of the spasm, or continuance of the atony in the extreme vessels. There

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only

only now remains to offer a few remarks on the terms sympathy and consent.

CHAP. V. SECT. III.

Some promised observations on the terms Sympathy and Consent.

CCLXVI.

I observed in a former part of the work, that these terms were liable to some objections and restrictions, and then proposed only to use them as the old language, that I might not, by the innovation of new terms in their stead, confuse my reader. (CCXCVII.) I still however find it impossible entirely to set them aside, as they often are most applicable to the subject. These terms have however been found useful to explain, or account for, occult causes, and are sometimes the last resource, *the ne plus ultra*, of a deficient comprehension. I do not think that they are strictly or justly applicable to that observance in point of time, which

which takes place between the affections of the stomach and skin in fever, as such sympathy could only properly arise from nervous connection.

CCCLXVII.

Agreeable to the explanation I have offered, the affection of the extreme vessels on the skin and primæ viæ appear to flow necessarily from the laws of the circulating system alone, the vigor of which, as depending on the heart for its fountain and support, being weakened, will naturally produce the consequences arising from such debility in the extreme vessels every where, but more particularly in those of the skin and primæ viæ for several reasons, and above all, from their being exposed to the action of many remote causes, that support the debility in them, but cannot affect the other parts.

CCCLXVIII.

In my opinion, therefore, the state of the extreme vessels in fever, both externally and

internally, which is a necessary consequence of the debility in the circulation, cannot be considered as strictly depending either on the nervous system, or any particular sympathy connected with it. The terms were properly used on the supposition delivered by Dr. Cullen, as no immediate or necessary connection could be supposed to take place between the extreme vessels of the skin, and the muscular fibres of the stomach, so that he was obliged to have recourse to a supposed sympathy. But on the supposition of my doctrine of *extreme vessels* being the true one, I would propose, that the terms *balance and connection* should alone be made use of, when the pathology of fever is the subject spoken of, as I think they are sufficient, because such *vessels* are essentially connected with the state of the circulating system, and accordingly are affected, when that system is debilitated (CCCXXXV.).

CCCLXIX.

This mutual balance and connection between the cutaneous extreme vessels, and the
analogous

analogous vessels of the primæ viæ, which are so apparently affected in fever, appear also to take place as necessary to the healthful state of the system. This may be observed from the peculiar effect of exercise, or any other active cause, on the state of these vessels, when such a cause increases the general circulation. This balance does not manifest itself in the terminations of the arterious system at the secretory organs; because, whatever increases the action of the heart and arteries, increases, as a necessary consequence, the quantity of the perspirable matter and sweat, yet at the same time does not seem manifestly to augment any of the other secretions, as if the terminations of arteries in the secretory organs were not similarly, at least not proportionably, affected.

CCCLXX.

The secretions in general are often variously and considerably affected by the influence of sympathy. The affections of the mind will often interrupt glandular secre-

tions. Thus we often see the secretion of milk suddenly stopped by distress of mind, and sometimes it will not return again. A balance is kept up between the secretions. This is most remarkable between the skin and kidneys. It also in a great measure takes place between the *breasts and uterus*. But a plethoric state alone of the circulating system most remarkably increases the secretions of perspiration, urine, and *sometimes* milk.

CCCLXXI.

The *other secretions* seem neither affected by the quality, or the quantity, of the circulating fluids, while both produce changes in the secretions I have just now mentioned; and it appears, that *the others* are only affected by stimulants, either immediately applied to their organs, or indirectly, through the affection of the sensorium, and the nervous system, agreeably to the laws of the animal œconomy. When the secretions are thus indirectly affected, the changes are produced through the power of sympathy, and not from any immediate balance or connection with the circulating system (CCCLXX.).

C O N C L U S I O N.

CCCLXXII.

I have delivered it as my opinion in several parts of the treatise, that the *extreme arterious vessels*, forming a part of the capillary system, are most likely to become the channels of *medical sympathy*, through the medium of the sympathizing heart (CXCIX.) I cannot therefore close the subject, without informing my reader, that some very eminent men are of a different opinion.

CCCLXXIII.

The sympathy of an animal body has been explained by the unisons of sound produced on the strings of a musical instrument. (LVIII. CCXVIII.) Such sympathy has been referred by Mr. J. Hunter to the system of *lymphatic vessels*. Mr. Cruickshanks is of opinion, that it takes place by consent of the *nerves*. And Dr. Cullen is an advocate, in *pyrexia*, *arthritis*, and *dyspepsia*, at least, for sympathy between *muscu-*

lar fibres. The reader is left to judge, which of the *above four opinions* is the most probable, or determine whether they are all mutually concerned.

CCCLXXIV.

It may be observed, that the minute parts of an animal body are so immediately connected with each other, that a mutual sympathy may, or may not, take place between them, and yet the *fact* cannot be easily ascertained. Nerves and vessels may sympathize with each other. This very strikingly appeared in an experiment made by the indefatigable Mr. Sheldon, whose laborious researches in anatomy and physiology will, no doubt, be rewarded with the acquisition of riches and honor.

CCCLXXV.

Mr. Sheldon divided the *carotid* artery in a dog, and afterwards tied it together. The union between the divided ends of the artery did not again take place, but the neighbouring part of the nerve *par vagum* shrunk
several

several inches in length. This may be looked upon as a singular instance of sympathy between an artery and a nerve.

CCCLXXVI.

The absorbent system has yet to engage the attention of speculative men. It must be left to the mutual labors of ingenious anatomists and physiologists (CCCLXXIII.) to find out, by dissection and serious reflection, of what consequence the *absorbent system* is, in the pathology of the animal œconomy. Its importance in the physiology of an animal body is now very generally admitted. I do not doubt, but that future investigation will discover, that *it* bears as important a concern in the pathology of fever, as is at present given to the *extreme arterious vessels*: for, it is certain, that many parts of the body sympathize with the absorbent system.

CCCLXXVII.

Mr. J. Hunter has mentioned such a case as the following, in proof of such sympathy.

thy. A woman pricks her finger with a needle, soon after which a red line appears, extending itself at last up the arm to the absorbent gland in the *axilla*, which then enlarges. Vomiting is shortly brought on in consequence of this, and is to be considered as a sympathetic affection.

In short, TIME only *can*, and *will*, discover to us, that life has been supported and preserved by sympathy alone. HE may not stop there, but may also particularly explain to us *hereafter*, how man not only continued to live, and move, and at last *died*, but how *originally* he had his BEING. Till then let us turn to the best use we can the knowledge we already possess.

END of the SECOND PART.

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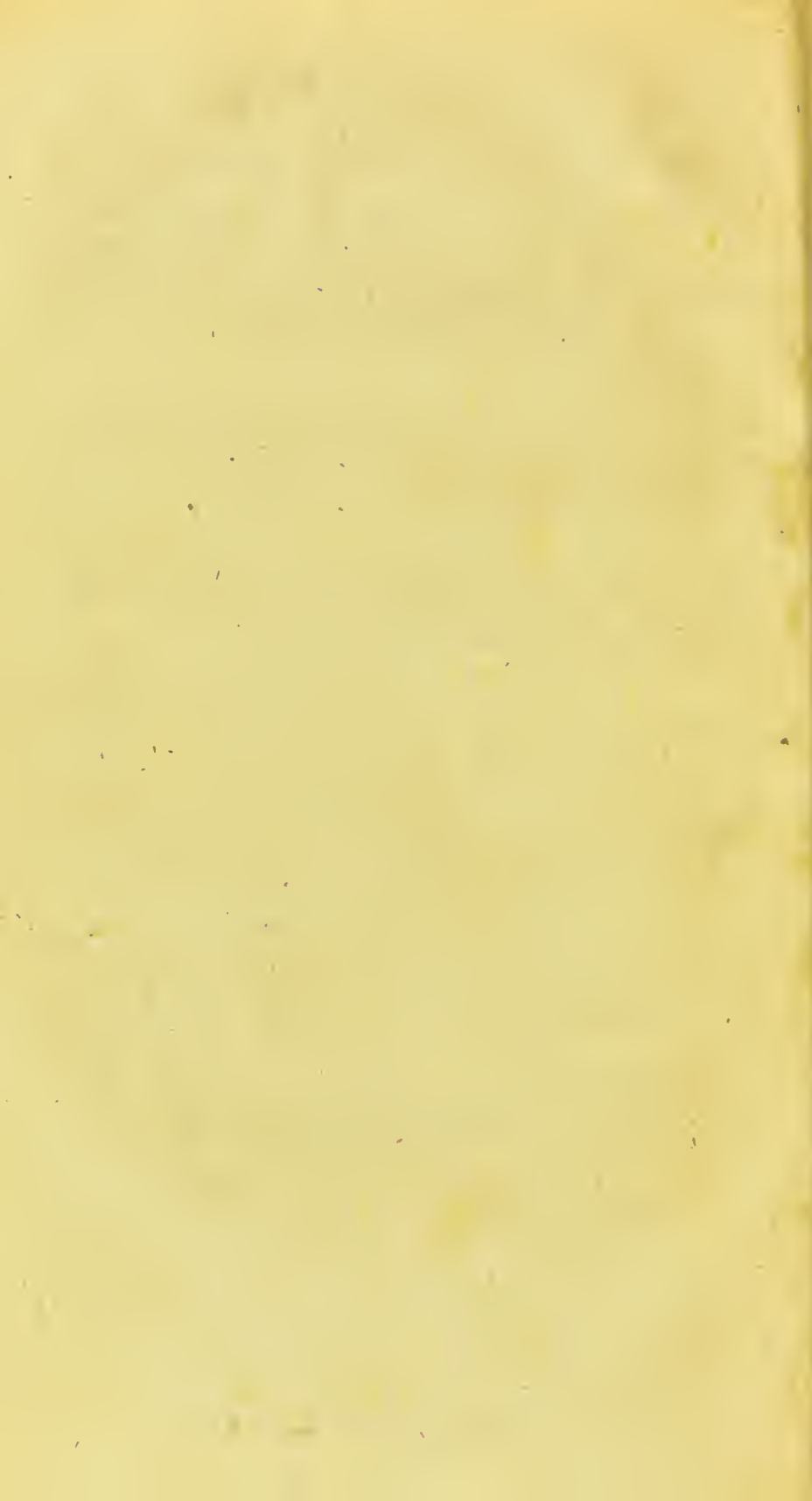
F I N I S.

E R R A T A.

Par. CXVII. For *deceased*, read *diseased*.

Par. CCLII. For (last part of CCLXVII. read CCXLVII.)

For *sympathic*, read *sympathetic*.



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